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THE AUTOMOBILE

What the AAA Tour Gave in Results

Besides Telling Forcibly of an Industry's Great and Permanent Progress

TOUR'S END, CENTRAL PARK, NEW YORK CITY.—TROPHY DONOR GLIDDEN, CHAIRMAN HOWER, AND A. A. A. SECRETARY ELLIOTT.

ONE judges more clearly something which is not so close at hand. A week ago, when the annual tour of the A. A. A. ended in New York City, with participants sun-blistered and weary, and cars dust-browned and shaking from restricted attention and the effects of the most strenuous endurance tour since the beginning of the industry, it was hardly possible for those who had figured actively in the affair to stand aside and properly appreciate the convincing proof that had accumulated in establishing the worth of the motor-driven vehicle. There always will be flaws in the conduct of any momentous event, and defects unquestionably existed in the running of the joint contest for Glidden and Hower trophies. But after those who had made the long journey had had opportunity of regaining cleanliness, putting on fresh clothes and enjoying a good night's rest, their vision cleared and they truly marveled at what had been accomplished by the sturdy vehicles which survived such a trying examination into their qualifications for appealing to the automobile buying public.

The consensus of opinion among those who circulated in and about the Hotel Astor, where the concluding features of the tour were enacted, was that next year there should be early and complete preparation for a prolonged endurance contest and those engaged should be made fully aware from the outset that the item of pleasure was minor and of the most incidental sort.

A rule calling for the naming of an observer by every entrant is the first demand of those who want a contest and are now thoroughly convinced that a combination of a contest with a pleasure tour won't mix any better than oil and water.

Some insist that everything which is done in the way of work on the car during the entire tour, in addition to keeping an exact record of the time taken, should be noted in order that the rules shall cover every possible contingency that might arise.

Since the next annual election of A. A. A. officers will take place in December, and those elected will assume office at the beginning of the new year, it should be possible for the incoming administration to get to work immediately on the events of the next twelve-month. It will be remembered that this year the newly elected officers were not in power until the first of March, which meant a delay of a couple of months on the year's work. As a result there was some tall eleventh-hour hustling on A. A. A. tour matters, and while Chairman F. B. Hower worked most industriously, his board could have made good use of the extra weeks which will be available another year. The chairman is now taking his well-earned rest in Colorado.

It was to be expected that there would be some criticism of the management of the tour. Every tour that has been held has received considerable attention from the critics, some of whom deal very fairly, while others seem inclined to search with a microscope for mistakes hardly worth mentioning. To those who had been through the mill of experience, it could not be other than amusing to listen to the complaints and criticisms of those who were having their initiation. Varied in nature and innumerable in number were the tales of woe that emanated from the tyros of the tour, though it must be admitted that there were things which could have been better, and which undoubtedly will be improved upon the next time.

It is the misfortune of every amateur organization that it seldom retains its best workers for more than a year so that they can profit by their mistakes. Perhaps not a few are disinclined to accept a retention of office when they discover that

THE DUST-BROWN CARAVAN TURNING OFF BROADWAY AT WEST 58TH STREET, IN THE HEART OF THE AUTOMOBILE DISTRICT.

the sum total of their efforts ofttimes receives less publicity than the few errors which are certain to be committed by the most painstaking official in his conscientious direction of an affair, the foundation of which has to be invariably built up from nothing.

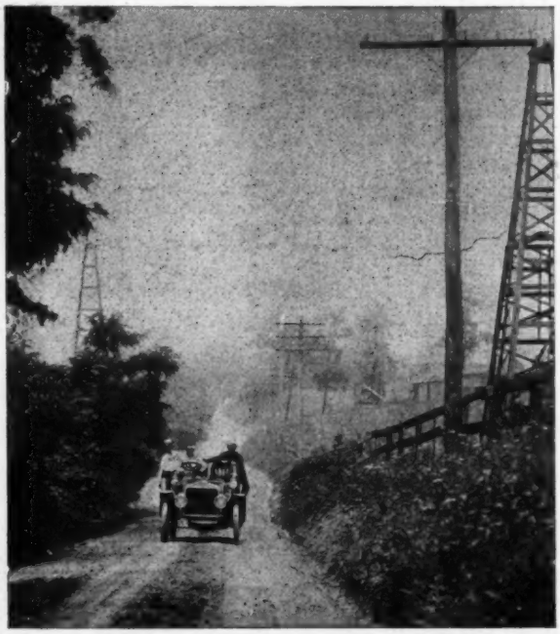
One of the lessons of the tour was not wasted upon the thousands of farmers who observed with a mixture of opinions the more or less flying progress of the new users of the highway. One tourist who took opportunity whenever occasion offered to chat with the agriculturists met with on the route found an Indiana farmer who expressed the belief that the time was not far distant when the old National Highway would be equally divided between motor-driven and horse-driven vehicles.

"Then you automobilists," said he, "can drive as fast as you want to and get the full worth out of your car with all safety."

"No," he continued, "I do not believe the farmer will be able to buy automobiles for some time in any great quantities; surely not until the price gets more within his means. We have got to keep horses for plowing and other farm work, and when you add an article, the greatest purpose of which is to carry you to town, it is something of too much luxury."

When told that a well-known automobile manufacturer had in mind the early making of a car of the tractor sort, which the farmer can attach to his plow or reaper and utilize in other similar ways, his interest was immediately aroused, and he announced that he would be ready and waiting when it appeared.

Of paramount importance to the automobile industry is the building of roads, and this subject, according to the observation of those on the tour, is destined in the early future to occupy an extraordinary amount of the public's attention.



RECOLLECTION OF PENNSYLVANIA'S OIL COUNTRY.

Of the seventy-nine automobiles which left Cleveland in connection with the A. A. A. tour in any capacity whatever, 64.5 per cent. arrived at destination with the main group. In noting the relatively high percentage of apparent failures, nearly 36 per cent., it should be stated that two or three, having set out with the intention of obtaining a clean score, dropped out of the run as soon as their record was marred, when they were certainly in a position to continue to the end. Three withdrew as the result of road accidents in no way imputable to the car; one abandoned on account of business, and one absentee was caused by the illness of the driver, with no substitute possible.

Some Interesting Statistics of the Tour.

Dealing only with those cars competing for trophies or certificates, nineteen of the forty-eight touring machines, or 39.5 per cent., finished the run with an absolutely clean score. In view of the strenuousness of the ordeal, the proportion is thoroughly satisfactory. Sixty-two and five-tenths per cent. of the competing touring cars finished the run as contestants, leaving 37.5 per cent. which were obliged to abandon owing to mechanical defects, road accidents, or continue as non-contestants from a disinclination to face the trying test any further. The mere fact of being penalized does not of necessity imply mechanical inferiority, and in addition to the nineteen cars with perfect scores five others having each less than 100 points penalization, giving a total of exactly 50 per cent., finishing the tour in an honorable position.

Among the runabouts contesting for the Hower trophy three out of twelve starters, or 25 per cent., officially finished the run. In view of the fact that many of these machines were duplicates in chassis

construction of those carrying touring bodies, the mortality by the way is remarkable, and can only be regarded as one of the little inconsistencies of a practical test. Logically the runabouts, with their lighter load, should have found the tour an easier affair than did the touring cars with four passengers and full load of baggage.

Engine Weakness Was Trifling.

It will be a matter of satisfaction to the general automobilist, the man who uses a car for pleasure or utility, that but three machines, or less than 4 per cent., had to abandon the run as the direct result of engine weaknesses. This proves most conclusively that the present-day automobile motor has reached an exceedingly high stage of efficiency, for the test to which the engines were put on the heavy ground and in mountain districts was of more than ordinary severity.

TOLL GATE KEEPERS MOVED LIVELY TO GET THE MONEY.

When attention is turned to transmission and drive, a less satisfactory state of affairs is found, for 58.6 per cent. of the cars, touring and runabout, which failed to finish officially, were eliminated by defective transmission, springs or axles. If deduction is made of withdrawals as the result of road accidents, it will be found that in nearly every case failure to finish was due to these causes.

Four-cylinder Engines Predominated.

Examining the thirty-nine machines of all classes which made the best records in the tour, 82 per cent. had four-cylinder vertical engines, 10 per cent. were two-cylinder opposed type and 8 per cent. were six-cylinder engines cast in pairs. The use of magnetos, of both high and low tension type, shows an ever-increasing tendency, for of the thirty-nine machines under examination 74.3 per cent. were thus equipped. This proportion is certainly not general among American automobiles, for the A. A. A. tour was favorable to the high-power automobiles, and our calculations are based only on those cars having made a satisfactory showing. It is suggestive, however, as showing the opinion in matters of ignition of the leading constructors of high-grade machines. On 68 per cent. of these cars, a high-tension magneto was used; 32 per cent. only had the low-tension system with make and break. If only one car from each maker were taken in arriving at these figures, the two systems would be found to be pretty evenly divided, for one firm figures with seven machines and another with four fitted with high-tension magneto, while the opposite school has in nearly every case but one competing machine per constructor.

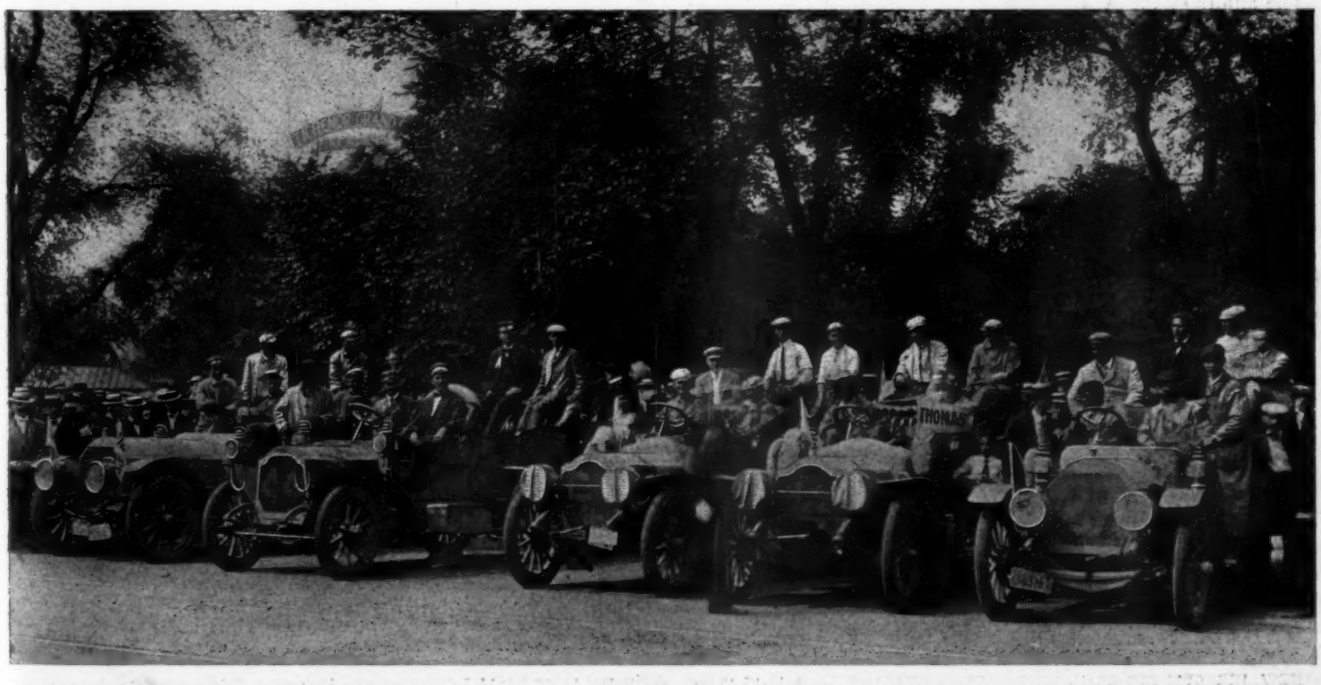
Sliding Gear Predominated.

Sliding gear transmission prevailed throughout, with the exception of a couple of small 16-horsepower machines. Crediting each maker with one machine, the proportion of those having selective type of transmission was 57.8, compared with 42.2 per cent. adhering to the progressive type. Final drive by propeller shaft prevailed in the proportion of 75 per cent., crediting each successful maker with but one machine; 20 per cent. had double side chains and 5 per cent. only used the single chain drive.

Leather-faced cone clutches were employed by 47.4 per cent. of the most successful makers. Grouping all multiple disc and kindred types of metallic clutches, they are responsible for the proportion of 52.6 per cent., which would show that, although the classical cone is no longer dominant, it is still popular.

Those That Just Fell Short.

In emphasizing the importance of the clean-score automobiles it should not be overlooked that a certain number of cars, while failing to obtain a position on the honor roll, have a perform-



BUFFALO'S TEAM, WHICH WON THE GLIDDEN TROPHY, NO. 17 PIERCE, NO. 44 PACKARD, NO. 9 THOMAS, NO. 11 THOMAS, NO. 27 PIERCE.

WHEN THE GOING WAS VERY ROUGH.

WHEN TRAVELING WAS SMOOTH.

THIS HOMESTEAD WAS WELL PATRONIZED.

ance to their credit which entitles them to some special mention. The Gaeth and the Oldsmobile, for instance, which each lost three points owing to road obstructions on the most difficult stage of the journey, are worthy of equal credit with the clean scorers.

Maxwell No. 58 suffered a loss of but 12 points, and Pierce No. 21 and Packard No. 44, which lost respectively 90 and 91 points, would certainly have finished perfect but for road accidents in which the machine was not at fault.

In the runabout class there was one contestant, A. E. Hughes, driving Pierce No. 100, who, through frequent punctures, just fell short of a perfect performance.

VICTOR OF FORMER YEARS NOT IN EVIDENCE.

Los Angeles, Cal., July 26.—Percy Pierce's familiar figure was missing from the tour of the American Automobile Association which ended last week, and many of the contestants wondered at his absence. It was explained by the fact that he is at present in this city and has been on the Pacific Coast for some time past in the interest of the bicycle department of the George N. Pierce Company, Buffalo, N. Y., of which he is the head. He has been making his headquarters with John T. Bill & Company, Tenth and Main streets, while in Los Angeles, and has expressed great admiration for Southern California.

A. A. A. OFFICERS SATISFIED WITH OUTLOOK.

The affairs of the A. A. A. are progressing most favorably, according to the reports presented at the July meeting of the Executive Committee, held Tuesday last at the headquarters of the Association, No. 437 Fifth avenue, New York City.

Chairman Charles T. Terry, of the Legislative Board, made an exhaustive report regarding the national registration measure which the Association has introduced in Congress and which will be vigorously pushed at next winter's session. The passage of this measure will greatly facilitate interstate automobiling, and at the same time make identification much less difficult and thereby appeal to the general public as excellent legislation.

Chairman Robert P. Hooper, of the Good Roads Board, reported concerning recent sessions of the committee composed of representatives of all the various organizations throughout the country interested in road building. Mr. Hooper was instructed to have his Board co-operate with the other organization.

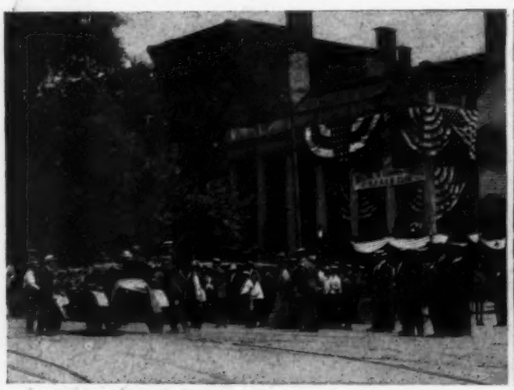
Acting Chairman A. R. Pardington, of the Racing Board, regretfully reported inability to secure a properly guarded course for the Vanderbilt Cup race, stating that a conference between Chairman Jefferson deMont Thompson and Cup Donor William K. Vanderbilt, Jr.,, in France had resulted in the decision to postpone the race for this year. A vote of thanks was tendered Mr. Pardington for his conscientious endeavors to bring about the holding of the race.

The report of F. B. Hower, chairman of the Touring Board, will not be presented until September, at which time the entire Board of Directors will meet. It was stated that the tour would result in a surplus. A year ago there was a substantial deficit at the conclusion of the tour.

Secretary F. H. Elliott reported that the membership was steadily increasing, and the figures of the treasurer, G. E. Farrington, showed the treasury to be in such condition as to insure the carrying on of the general work of the organization for the ensuing year.

President William H. Hotchkiss presided at the session, the others present including First Vice-President L. R. Speare, G. E. Farrington, A. G. Batchelder, Chairmen C. T. Terry and R. P. Hooper, and Secretary Elliott.

Prince Henry of Prussia has presented a new trophy in place of the Herkomer (which will henceforth be run off in England), and has informed the Imperial Automobile Club of the terms of the gift. The contest will be run for three consecutive years, with Berlin as the starting point and the finish at Frankfort-on-the-Main.



NEW JERSEY'S BIG CLUB WELCOME IN NEWARK.

AUTOGRAPHS ACCUMULATED.

DAI LEWIS PARTAKES OF JERSEY CITY HOSPITALITY.

WHITE BEATS STODDARD-DAYTON IN RUNABOUT TIE

TO settle the tie between the White steamer and the Stoddard-Dayton runabouts, which finished the A. A. A. tour with perfect scores for the Hower trophy, the two cars were sent away from the Automobile Club of America's garage on Monday morning of this week for a run of unknown length. On the completion of the A. A. A. tour the two perfect-score runabouts were locked up to prevent the possibility of replacements or adjustments, pending the decision of the tour's executive committee. That body decided on an additional run, first to Cleveland, with stages at Albany, Syracuse and Buffalo, then forward over the Glidden tour route until one of the cars was penalized.

STODDARD-DAYTON TIE PERFORMER.

E. L. Leinbach again took the wheel of the gasoline car and H. K. Sheridan, of the Cleveland Automobile Club, continued to pilot the White steamer.

Secretary Dai H. Lewis, of the A. A. A. Touring Board, has charge of the tour, preceding the contestants by three hours on a Stoddard-Dayton confetti car, driven by W. W. Macdonald, and each of the contesting cars carries an observer. Walter White is accompanying the contestants.

ALBANY, N. Y., July 29.—The result of the first day's run of the two clean-score runabouts was that both machines reached Albany with their perfect record unbroken. The run of 150 miles was planned on a schedule of 17.2 miles an hour, and was covered by the contestants in 8 1-2 hours, roads being in excellent condition. From here the Stoddard-Dayton and White will run to Syracuse on a schedule calling for twenty miles an hour in the open country and ten miles an hour in towns.

SYRACUSE, N. Y., July 31.—No change has yet occurred in the tie for the Hower trophy, the Stoddard-Dayton and the White steamer having reached here with their clean records unbroken, and will start forward this morning with Buffalo as their evening destination. Although detours were made necessary as the result of road repairs, increasing the distance to 155 miles, H. K. Sheridan's 30 - horsepower White and G. S. Smith's 35-horsepower Stoddard-Dayton accomplished the journey within the schedule time of 7 hours 45 minutes, and experienced no trouble en route. Drivers report road conditions as fair. On the weighing in of the observers—appointed by the rival party—it was found that the official on the Stoddard-Dayton car tipped the scale at 268 pounds.

WHITE STEAMER TOP NOTCHER.

Dai H. Lewis, of Buffalo, precedes the contestants in a confetti car and has charge of the supplementary test.

BUFFALO, July 31.—The White Steamer is the winner. It reached here with a clean score, meeting the 163-mile schedule of 8 h. 30 m. At 5 P. M. the Stoddard-Dayton was still missing, being then a half hour late.

WHAT ONE AIR-COOLED MAKER THINKS OF THE A. A. A. TOUR

Editor THE AUTOMOBILE:

Considerable comment has been appearing in the automobile press of late regarding the absence of air-cooled cars in the 1907 Glidden Tour. One well-known manufacturer went so far as to say, in the columns of "The Automobile," that this absence might be taken as proof of the superior worth of the water-cooled theory. He might have gone even further and stated that the scarcity of entrants this year was due to the fears of a large number of manufacturers that did not participate. Such a statement would have been equally correct—and equally incorrect.

Speaking for the Marmon, we feel that our perfect score in the 1906 tour will have to be sufficient for the time being. Those who were on the 1906 tour know that the air-cooled motors stood the hard work with less annoyance from heating than the water-coolers, and the files of the automobile press of a year ago will corroborate it. This was all we sought to prove, and the rules, either this year or last year, would permit us to prove nothing more. In common with many other manufacturers, we have reached the opinion that there is scant glory to be had in an event where there are so many winners—13 out of 67 last year, and 19 out of 47 this year. Had it not been for the heavy rains this year the perfect list would have been even larger. It required only one reading of this year's rules to foresee the result. With the 1908 season about to open and the shows coming early, we did not consider it worth while to deprive our manufacturing and sales departments of important men for the tour.

ONLY "AUTOMOBILE" READ AT BEDFORD SPRINGS.

We hope the A. A. A. Tour will be different next year. We know of many manufacturers who would be glad to participate in a real test, with severe conditions, official observers and a touring committee that would enforce rigid rules without fear or favor. Until such a test is arranged we shall probably stay in the shade with the wise ones and keep cool.

NORDYKE & MARMON CO.
Indianapolis, Ind.

AT PONT L'EVEQUE, ON THE NORMANDY COURSE, THE SCENE OF NEXT WEEK'S PRESS CUP RACE.

SPEED FINAL TEST IN FRENCH TOUR.

PARIS, July 23.—The only touring event directly organized by the Automobile Club of France this year will commence on August 2 and finish five days later. During four days 994 miles must be covered, partially over mountain roads, under ordinary touring conditions, at an average speed of 24.8 miles an hour, with four passengers on board, the full weight of the car, including passengers, not to be less than 3,630 pounds. A rigorous system of parking will be observed at each control, running time to include all attention to motor, tires, filling of tanks, etc. For the four-day touring event the cars are only required to conform to certain overall measurements, height of seats and length from dashboard to rear wheel. When this test has been successfully undergone, a final race will be held in which the fuel allowance will be 4.1 gallons per 62.1 miles.

In the equipment of the cars it is stipulated that the gasoline tanks, which must be of an approved type, and capable of containing 17.6 gallons of fuel, shall be placed either directly behind the front or behind the rear seats. Being fully in view, any attempt at fraud will at once be apparent. Beyond the fact that passengers may be changed at controls if desired, and that dismountable rims may be used and fresh supplies of rims and tires taken up anywhere en route, the touring event will not differ from the usual run of such affairs.

At the end of the fourth day's run one hour will be allowed for changing tires and putting the machines in condition for the fast run. No essential parts, however, must be changed, and it is absolutely forbidden to make any alteration in the gearing of the machines, the intention being to run the race with the cars in exactly the same condition as for the touring test. Before the start of the tour from Paris the gasoline tank, piping, carbureter and all organs by which fuel might be introduced, will be sealed in the manner adopted for Grand Prix racers, the tank cap alone being left open until the last day. After the regulation supply of gasoline has been given, this will also be sealed down. At any time during the test the gearing of the car may be verified by the committee and the minimum weight must be maintained during both touring and race days.

The Lisieux circuit, which has been chosen for the final race, is one of the fastest to be found in Normandy; the naturally good roads have been specially prepared for the speed test and will be guarded on the day of the race by 2,500 troops. Though a double-barreled event, the result of the race will alone determine the winner, only those machines being allowed to start in the final which have accomplished the four previous stages on schedule time and without replacements.

Forty-four cars have entered for the Criterium and the Press Cup, the large majority of them French. They are: Gladiator 2, Peugeot 3, Mercedes 1, De Dion-Bouton 3, Vinot & Deguingand, German Chainless 2, Dietrich, Gobrin-Brillie, Aries 2, Cottin & Desgouttes 3, Cornilleau & Sainte-Beuve 3, Argyll Motors, Limited, Mors 3, Martini 2, Gillet-Forest, Motobloc, Martin & Lethimonnier 2, Regina Dixi 3, M. R. G., Eugene Brillié, Rebour, C. G. V., and Westinghouse.

NEW BLERIOT AEROPLANE WITH ANTOINETTE MOTOR.

BLERIOT PRODUCES NEW AEROPLANE.

PARIS, July 22.—After experimenting on an aeroplane having the form of a wild duck, M. Bleriot, the French aeronaut, has produced a new and original model of flying machine of the Langley type. Chassis construction consists of a square section frame narrowing towards the rear, mounted on three bicycle wheels, with coil springs between the front axle and the frame. At the forward and rear end of the chassis are a pair of wings, the outer edge of each forward wing having a pivoting rudder. A 24-horsepower Antoinette motor installed at the fore end of the frame operates a two-bladed propeller. The driver's position is in the center of the frame, his head only being visible. The necessary levers for controlling the engine, the rear rudder and the two wing rudders, which may be operated either simultaneously or independently, are conveniently brought to his hand. Initial experiments on the Bagatelle polo ground near Paris, with three different sets of propellers, failed to cause the machine to leave the ground, the defect of the aeroplane being that it is too heavily weighted forward. The frame will be lengthened in order to give greater bearing surface forward, but it is not expected that very good results will be obtained until the new 50-horsepower Antoinette motor is installed.

FRANCE TO TEST WRIGHT BROS.' AEROPLANE.

PARIS, July 27.—Immediate developments in connection with the Wright brothers' aeroplane mystery are expected as the result of the arrival of Orville Wright, of Dayton, who joined his brother here yesterday. It is declared that the Wright brothers' machine is now in France, and that a flight will be arranged shortly under conditions which will safeguard the inventors' secret.

A NOON-DAY CONTROL ON THE BELGIAN TOURING COMPETITION, WITH CARS PARKED IN FRONT OF MALINES RAILROAD STATION.

TOURING AND RACING IN BELGIUM.

OSTEND, BELGIUM, July 22.—Belgium, from north to south and from east to west, is alive with automobiles and buzzing with automobile interest. The Criterium, a five-barreled event comprising a regularity test, a kilometer flying and a mile standing race, a ten-kilometer race and a five-kilometer hill climb, opened the proceedings at Spa. While bustling officials occupied themselves with weighing-in, verification of cylinder areas, and details of organization, energetic gendarmes earned universal disgust by holding up every automobilist passing over rain-sodden and deserted Avenue du Marteau.

Seven classes were provided for the 34 entrants, commencing with 75 millimeters bore and a minimum weight limit of 1,540 pounds, and increasing by stages to 145 millimeters cylinder bore, the increase of weight being 35 pounds for every millimeter above 75. A couple of 15-horsepower four-cylinder Ford runabouts figured in a class by themselves with a total weight, including two passengers, of 1,698 pounds. French and Belgian cars of an equal cylinder bore weighed as high as 3,300 pounds.

During the three-day stop-over at Ostend, racing cars, as well as the tourists engaged in the Criterium, took part in the ten-kilometer speed tests over a five-kilometer track, a standing start being given in each direction and the times additioned. Rigal, driving one of the Grand Prix Darracq machines, made the fastest burst of speed in 5:6 3-5; Baron de Caters (Mercedes) came second in 5:34 3-5; Hyeronimus, also on Mercedes, was third in 5:35 4-5; Christiaens, driving a Sporting Commission Darracq, came fifth, and De Langhe, on the Darracq racer with which he won the Sporting Commission Cup, finished last. Giuppone, on a Peugeot motorcycle, was the fastest of his class, in 6:34, against a small field of competitors.

Despite the hot weather, which was the cause of considerable tire trouble, the touring event was more of a pleasure jaunt than a tour, practically all the competitors accomplishing the stages at 18.6 miles an hour according to schedule; interest, therefore, centered entirely around the speed tests. The Franchomme Cup, for the best performance on a seven-kilometer hilly road, was awarded to Wery, driving a Belgian Nagant car. Awards were made according to a point system which gave every competitor, of whatever class, an equal chance. In actual speed the Nagent was also the winner, his average being 62.9 miles an hour.

For the Prince de Caraman-Chimay Cup, which comprised a three-kilometer straightaway, a mile on a slight grade and 300 meters on a 14 per cent. grade, the same system of classification by points for all classes was adopted, Servais, on a chainless Germain, proving the winner, with Cissac, on a single-cylinder Alcyon, a good second.

Three Distinct Races for Classic Ardennes Course.

Owing to the multiplicity of regulations, three distinct races have been arranged over the Ardennes circuit on July 25, 26 and 27. The first day will be for machines competing under the German Emperor's Cup rules, the second day the Liedekerke Cup will be held on a limited cylinder area, and the third event, open to all, will unite principally Grand Prix racers. The present entry list for the open race is three Lorraine Dietrich, the two British Weigals built for the Grand Prix, a Darracq to be driven by Huntley Walker, and Jenatzy and De Caters each with a Mercedes. The Mercedes to be driven by Baron de Caters is the one with which Hemery secured ninth position in the Grand Prix. It is expected that the full Bayard-Clément team and one Porthos will join before the final closing.

According to an incomplete *Herald* cable report from Bastogne, the Ardennes race under the German Emperor rules was won by Moore Brabazon, 17 seconds ahead of Koolhoven, wth Guinest 1:8 behind second man. The distance, 372.6 miles, was covered by the winner in 6:14:15. There were twenty-three entries.

CHRISTIE'S FAILURE DUE TO UNPREPAREDNESS.

Chairman Jefferson De Mont Thompson, writing from Paris, where he has been staying in expectation of being able to make arrangements for the Vanderbilt Cup race, states that Walter Christie's failure to make a showing in the Grand Prix was due to his late arrival on the course and small opportunity for practice. French experts agreed that the "Blue Streak" was fast, well designed and carefully built, but was unable to show its qualities through unpreparedness. American racing constructors, according to foreign belief—which pretty near approaches a certainty—are slow to learn that early prepartaion is half the battle. Christie was keenly disappointed, but will try again.

Mr. Thompson, as A. A. A. representative, did all that was possible to assist the American driver before the race, and was present at the starting line to give Christie and Strang a send-off. Mr. Thompson is now touring in Germany, and will not return until August.

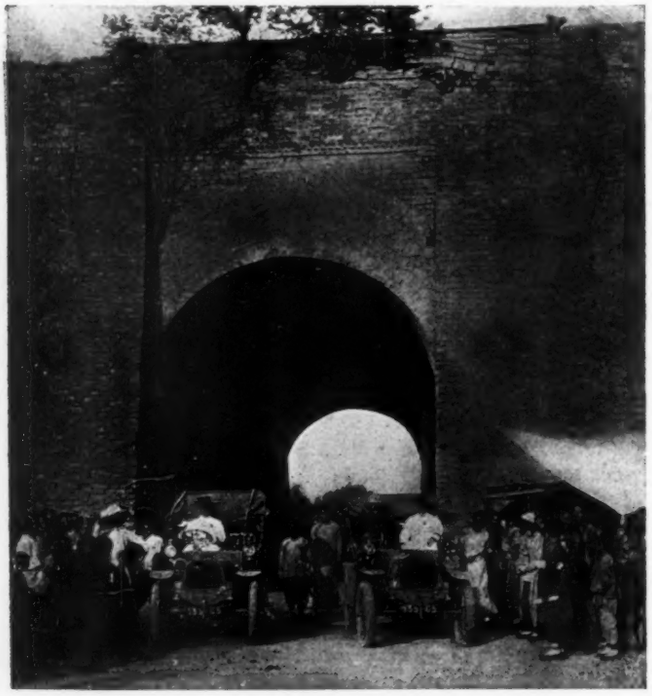
CHAIRMAN THOMPSON WISHING CHRISTIE GOOD LUCK.

PEKIN-PARIS ELIMINATES ONE.

Nobody will deny that there was a more than ordinary amount of pluck in the attempt of the three French, the Dutch and the Italian chauffeurs to run their automobiles entirely by their own power from Pekin to Paris. Judging from the reports which are to hand from the small procession, four of the cars will accomplish the colossal feat and will in a few weeks' time be in the French capital again.

Cormier and Collignon, two veteran European tourists, took charge of a couple of 8-horsepower De Dions, Godard mounted a 16-horsepower Spyker of Dutch origin. Prince Borghese equipped an Itala of 40-horsepower for the fray, and Paul Pons looked to a Contal tricar of Parisian origin for his means of locomotion over a continent that had never seen an automobile.

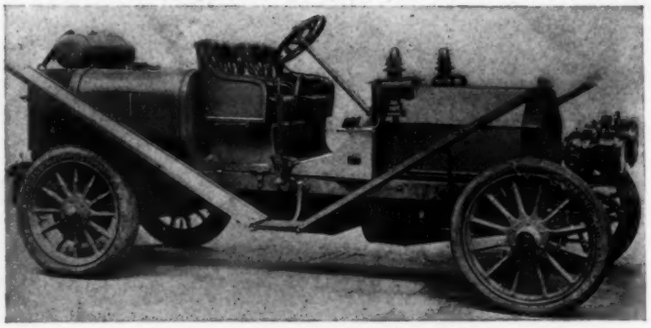
Starting from the French legation at Pekin, the five kept together for about a third of the journey, when the Contal tricar had reluctantly to abandon the tour, the heavy equipment necessary for camping out, fording streams, bridging ravines, etc., being too heavy a load for a three-wheeler. Although provision had



LEAVING PEKIN FOR PARIS, DE DIONS IN FOREGROUND.

been made for a supply of gasoline to be placed along the line of march, the stages were widely spaced and it was necessary for the cars to be able to carry an exceptionally large quantity along with them. The illustration of the Itala will show how special storage room was obtained, this Italian machine having a large tank securely fastened behind the two seats. The Itala, as well as the Contal, had portable bridges, those of the Italian car doing duty as mud guards on ordinary running. Contal's bridges, which were carried on stays at each side of the driver, had a triple use—they acted as mud guards, they formed tent supports and they could be braced up for getting across a stream or a ravine.

Undoubtedly the most hazardous portion of the journey was the 700-miles trip across the sandy wastes of the Gobi desert. One hundred miles from Udde and four hundred miles from Ourga, the Spyker found itself stranded without a drop of gasoline in the tank, the Itala miles ahead and the two De Dions wandering no one knew where. Fortunately, the French machines caught sight of the fuelless Dutchman, calculated the amount of gasoline they would need to the next supply station, gave the rest to their companion and, when they reached the welcome tanks, shipped a supply back to the wanderer by a camel caravan. Over desolate,



ITALA: SPECIAL TANK, PORTABLE BRIDGES, PIRELLI TIRES.

rocky wastes, with not a soul in sight, up mountain sides, down precipitous slopes, then again up impossible grades, the five plodded on until Ourga was reached, and the director of the Russo-Chinese bank welcomed them to a joyous fete.

From the thousand-roofed golden palace, where the "Little God" of Lhassa had taken refuge since the British occupation, a message came for the Pekin-Paris travelers. The "Little God" had an automobile, a fragile little thing that never had run; would the great travelers come and animate its silent organs? But the "Little God's" automobile was irreparable, and when the party moved forward it was left behind to an eternal silence.

Grades of 15 to 20 per cent., tracks of thickly wooded country, heavy rain which transformed the land into a huge bog, streams which could only be forded by the aid of ox-teams, are the themes of the letters describing the going, until Kiakta, the outpost of European civilization, was reached. From this point the telegraph takes up the story, more graphic in its simplicity than any flowery word-painting. This is what Cormier has to say:

"Prince Borghese is crossing the Baikal by boat. We were more sportive and intend to get around by our own power. Discovered, however, that the rivers flowing into the lake are too numerous, too deep and lacking in bridges for us to do it. Forced at last to come back to Misovaia and take the boat, as the Prince had done.

"[Later]—Have changed our plans. Boatmen ask an exorbitant price, and we shall cross the Baikal by train.

"Have covered 320 miles in two stages. Reached Nyneulinsk. Country more civilized now, but raining continuously.

"Covered 200 miles in two days. Had rained continuously for eight days. Are worried by squadrons of mosquitos. What next?

"Covered 150 miles last stage. Spyker having magneto troubles; intends to come by train to Tomsk for repairs, go back and start again. *Matin* has cabled that taking train will disqualify.

"Traveled 115 miles to Atchinsk. It has stopped raining. Roads are a bog, but we are still going on.

"Reached Marinsk, covering 125 miles to-day. Nothing but mud; but the roads are better than those of China. We are making progress."

DISEMBARKING SPYKER CAR AT PEKIN RAILROAD STATION.

GRAY CAST IRON IN AUTO CONSTRUCTION*

By THOMAS J. FAY, E.E.

IT would be a great boon if this product could be eliminated from automobiles, but it is almost the exclusive material for use in cylinders and pistons, and it is occasionally used for crankcases in "double-opposed" motors and for "planetary gear" housings.

There are cars employing this material for wheel hubs, compensating gear housings and brakedrums, but such cars have no claim on the affection of users of automobiles and never will have. The dominant idea is to get rid of castings of all kinds, and especially gray cast iron, because it has not the one advantage rightly claimed for aluminum, in other words, cast iron *is not light*, whereas aluminum is.

In a general way, cast iron is stronger than aluminum and under certain conditions will do what aluminum is not suited for, nevertheless, as before stated, cast iron does not hold out as much promise as one could hope for, but for piston packing rings, good gray cast iron seems to have no equal, and for that purpose it is a commendable product.

From time to time attempts have been made to produce cylinders and pistons of steel forgings, but such enterprises were confined to racing car work, and as yet such efforts have not amounted to very much, although the few cylinders the author has been enabled to examine looked all right, even after a goodly amount of service.

The main trouble lies in being unable to so design cylinders as to produce them in forgings, at a cost to be tolerated in cars for commercial purposes. In racing cars, cost is not considered if only the cars can be made to excel. Pistons could be produced in steel forgings very well indeed, but if cylinders are of cast iron, pistons should be of the same material, this being one case in which similar metals work together without showing bearing distress.

At the present time "gun steel" forgings are being experimented upon for cylinders and pistons and, if the shapes can be suitably modified, there are prospects of success, for gun steel is a very good product for just such purposes. Figure 3 illustrates a turning from L. B. R. Krupp gun steel that in itself shows a remarkable product, but, contrary to the general belief, gun steel is not of extraordinary strength, as the test CVII will show.

For the present, at any rate, gray cast iron must be tolerated, and if so, to get all there is in it, a study must be made of its characteristics and its vagaries must be mastered, else "wasters" will be a-plenty and casualties in service will be numerous.

Gray cast iron, in the sense that it is referred to here, is a remelt, in a cupola, of suitable grades of blast furnace pig iron. The gray variety of cast iron is that holding such an excess of graphite as to conceal the iron from view in the fracture. It is a foundry problem to arrive at any desired result by mixing the material for the charge to the cupola in such proportions as to afford cast iron holding requisite qualities for any given purpose, and for cylinders as used in automobile motors. This problem is one out of the ordinary and to it may be said success is rarely assured.

The low limit of total carbon in cast iron can be set down as 2.20 per cent., although, having done so, it means very little to the automobile engineer because the limits for cast iron of the requisite qualities in cylinder work are very well defined. The components in cast iron are iron, silicon, sulphur, phosphorus, manganese, combined carbon, graphitic carbon and more or less "slag." While this latter compound is not desired, it does abound more or less in castings and must therefore be taken into account.

Unlike in steel, the components sulphur and phosphorus are held at a fairly high limit for reasons that will be explained, although, as in steel, these elements have their painful influences on the strength and endurance of the product.

In general, the limits to be put on the elements entering into the castings for cylinder and piston work can be set down once for all, viz.:

Combined Carbon,	Maximum	0.75%
Silicon	"	1.20%
Sulphur	"	0.085%
Phosphorus	"	0.50%
Manganese	"	0.75%
Slag and Oxides	"	nil.

It will be understood the components range at variance with these maximum values, and in fact silicon generally exceeds the

CHEMICAL COMPOSITION			
CARBON	TOTAL		3.262
	COMBINED		0.137
	GRAPHITE		3.125
	FERRITE		
	PEARLITE		
	CEMENTITE		
Cr.		Ni.	
V.		W.	
Mn.	0.31	Si.	2.46
Al.		Cu.	
S.	0.052	P.	0.81
Sn.		Zn.	
Pb.		Sb.	
As.			
PHYSICAL PROPERTIES			
T.S. / E.L.	LBS. PER SQUARE INCH		16500
EX. / CO.	PER CENT.		
PROOF	DIAM. "		
	LENGTH "		
FRACTURE			
RATING	U.		
	H.		
TREATMENT			

SUBJECT: GRAY CAST IRON
NUMBER: 1 MARK:
FROM: EUREKA FOUNDRY
NEW YORK, 4-17-07 19

THE COMBINED CARBON WAS VERY LOW.
THE MANGANESE WAS LOW.
THE SILICON WAS HIGH
THE SULPHUR WAS WITHIN THE LIMIT.
THE PHOSPHOROUS WAS WITHIN THE LIMIT.
30 H.P CYLINDER 4½" BORE 5½" STROKE 5/16" WALLS
THE CYLINDER FAILED TO PASS.

limit set as desired, notwithstanding the fact it tends to a lowering of tensility but it also affords fluidity which is a much needed quality in cylinder irons. It will be no surprise then to discover higher silicon than that desired in cast iron for cylinders and, as a matter of fact, it generally ranges between 1.40 and 3.25 per cent., although this latter value augurs an inferior product.

In fairly good castings the silicon content is likely to run about 1.60 per cent., but even this value will show on the tensile strength, although good sound castings must rank first, and it is customary to assume that gray cast iron for cylinders should have a minimum value of the tensile strength of 18,000 pounds per square inch, which value can be expected in good, sound castings even with silicon at 1.60 per cent.

Right here, it may be well to point out that claims of even 35,000 pounds per square inch are frequently made for cylinder castings, and few will admit that the strength should be less than 26,000 pounds per square inch. At all events, it matters not what the strength may be in isolated cases since none will guar-

*Extract from Chapter II, "Gray Cast Iron," "Materials for Automobile Construction," by Thomas J. Fay, E.E., published by the Class Journal Publishing Company, New York. Owing to lack of space but few of the illustrations or tests referred to are inserted.

CHEMICAL COMPOSITION				
CARBON	TOTAL			3.92
	COMBINED			0.50
	GRAPHITE			3.42
	FERRITE			
	PEARLITE			
	CEMENTITE			
Cr.		Ni.		
V.		W.		
Mn.	0.27	Si.		1.80
Al.		Cu.		
S.	0.14	P.		0.33
Sn.		Zn.		
Pb.		Sb.		
As.				
PHYSICAL PROPERTIES				
T.S.	LBS. PER SQUARE INCH			
E.L.				
EX.	PER CENT.			
CO.				
PROOF	DIAM. "			
	LENGTH "			
FRACTURE				
RATING	U.			
	H.			
TREATMENT				

SUBJECT: GRAY CAST IRON.
NUMBER: VIII MARK:
FROM: FULTON FOUNDRY & MACHINE CO NEW YORK, 9-17-07 19

USED IN THE ELLSWORTH DIRECT-COOLED MOTORS THE LIMIT OF PHOSPHOROUS IS 0.50%. - SULPHUR SHOULD NOT EXCEED 0.085%. - SILICON SHOULD NOT EXCEED 1.20% MANGANESE SHOULD NOT EXCEED 0.75%.

IN THIS CYLINDER THEN THE SULPHUR IS EXCESSIVE, AND THE SILICON IS ALSO IN EXCESS. ALTHOUGH SILICON OFTEN TIMES EXCEEDS THE DESIRED MAXIMUM CYLINDERS OF THIS MIXTURE GAVE TROUBLE, AND CHANGES IN THE MIXTURE WERE FOUND TO BE DESIRABLE

antee every casting to be up in any such values, and safety demands that the minimum value be taken as the maximum in practice.

To illustrate the extent to which slag and oxides will defeat the aim to procure good sound castings, the author only needs to refer to a single recent experience as follows: It was desired to procure four cylinders for a motor and the first forty-nine cylinders procured—to get four—were so imperfect as not to be used. By changing the mixture, the methods of gating and other changes besides, it was finally possible to procure thoroughly good castings.

In this instance the pattern could not be claimed as at fault in any essential particular, nor was the pattern changed, excepting to eliminate a little extra metal from one or two places and to add a little extra finish to the valve seats. The castings were porous, spongy, and had blow-holes or other defects, but the defects did not persist in showing up in any one zone. When the castings finally came out good enough to use, they looked good and undoubtedly the "mixture" had much to do with the final success, as well as the series of preceding failures.

This instance of persistent failure is but one of many coming to the author's notice from time to time, but this case was a little unusual because the foundry was one fitted up for this class of work and, as a rule, its product is thoroughly good as cylinder castings go. This illustrates one other point, *i.e.*, a new pattern always offers new problems and is likely to engender complications in diverse ways. Nor can the foundry be expected to produce good cylinder castings directly. Some fitting out must be done; hence, to realize the best results, cylinders must be ordered in quantity, this enabling the foundry to break in coremakers and moulders.

To reach a good understanding of the wants of the automobile engineer the matter of gray cast iron for cylinders and pistons must be elaborated on a basis involving three points of view, viz.:

(a) The desired condition of the cast iron, taking into consideration its micro-structure.

(b) The design of the castings, taking into account the desired strength and the needed shape as well as the foundry problem.

(c) The governing conditions as drawings, patterns, cores, fixtures, etc.

The desired condition of the castings from the point of view of the chemical composition and the micro-structure can scarcely be elaborated upon in the manner common to the treatment of this subject. Fixing limits of the components is by no means fixing anything, because limits as fixed, rarely, if ever, obtain in the actual castings, although it is well enough to have in mind the fact that excesses of one or the other of the contents will tend in directions that can be set down.

It is the relation of the elements that truly counts for good or for evil, and it is this relation that is shrouded in mystery, although advanced writers have endeavored to lucidate the subject, but have failed alternately to impress an audience which, however, is to the discredit of the audience, rather than due to lack of effort on the part of the doctors.

As a general rule the question of the condition of the elements and their relation is quite beside the discussion, and the whole matter is resolved into a simple statement of the percentages of the elements present and a guess—in the dark—as to what should result under such conditions.

Sanveur, Howe, Harboard, Fol and other metallurgists, have repeatedly pointed out that the carbon condition is paramount and that the total carbon is a secondary matter for discussion, or better yet one of the factors. How fruitless it is then to merely fix upon the total carbon or the combined carbon on the one hand and the graphitic carbon on the other, what the carbon combines with, how it combines and the combinations so formed, would seem to be of extreme importance, but from all accounts these matters are in many instances, at any rate, left out or given but scant attention.

Quite recently Robert Fol, for the *Cycle and Automobile Trade Journal*, December 10, 1906, reported on some thirteen cylinders and gave photo micrographs to sustain his position. While the report is only of passing interest here, the prime fact is worthy of much consideration in that of the whole number of cylinders investigated none was above criticism and all but two of them were quite below any standard of usefulness that should obtain in automobile work. Some of these cylinders were made abroad and they offered no advantage that anyone would care to copy.

If one should take all of the evidence to be had on every hand and judge accordingly, it would be to say that cast iron is by far too irresponsible to use in automobile work at all, but on the other hand cast iron is used, quite to the exclusion of any other product for cylinders and pistons and in most cases the cylinders and pistons so made do serve the purpose.

Gray cast iron, unlike steel, holds graphite as one of the carbon conditions, and it is the presence of this same graphite that makes the difference for the most part between cast iron and steel. The graphite is simply present as an excess over and above the quality of carbon that will combine to form cementite, pearlite-ferrite or such other product as may be developed under the several conditions possible to bring about.

If, in gray cast iron, the total carbon is upwards of four per cent., it is at once plain that graphite will be present in considerable excess, because, in the nature of the product, combined carbon will be far below the point of chemical absorption of all the carbon present.

The graphite present is indirectly an indication of softness in proportion as the graphite shows in excess, but it is something of a fallacy to attribute this softness directly to graphite. Softness and ability are due to a small amount of cementite and relatively a large amount of ferrite rather than to a large excess of graphite.

If, then, the total carbon is a constant, the soft iron will show a large excess of graphite because the total combined carbon will be low, and if this condition obtains, the ratio of ferrite to cementite will be more nearly in accord. True, graphite itself is of low strength, and an excess of graphite enmeshed in the matrix must have its weakening effect, but the difference between cast iron and steel lies in this fact. Steel holds little or no

graphite, hence the matrix is not laminated with graphite and the strength of the matrix then holds rather than the strength of the laminations of graphite and the matrix as in cast iron.

When liquids solidify, the freezing process involves a "entectic," an excess or an unsatisfied liquor, and it does not seem to matter what the compound may be, the phenomena are common to all; iron and steel are no exception to the rule and, in the main, it is possible to predict what will be the structure, if only one may know the composition and control the process.

A product holding 0.90 per cent. carbon will resolve itself into pearlite if the "teemed" mass is allowed to freeze unrestrained. This, then, is a gauge point ever to be kept in mind. If, however, the total carbon is less than 0.90 per cent., there will be an excess of ferrite and lowering the carbon increases the ferrite and diminishes the pearlite in direct ratio as follows:

$$90 : Y :: 100 : X.$$

When

90 = the total points of carbon in a pure entectic of iron and carbon.

Y = the points of carbon in a hypo-entectic mass, that is to say, a mass holding less than 90 points of carbon.

100 = the percentage of pearlite—a carbon condition—in a mass holding 90 points of carbon.

X = the pearlite present with Y points of carbon.

As for example. Steel, holding 0.45 per cent.—45 points of carbon—would hold pearlite as follows:

$$90 : 45 :: 100 : X = 50 \text{ per cent.}$$

Since only 50 per cent. is pearlite, the balance must be something besides, and in a hypo-entectic, the balance is ferrite, and that balance must be: 100 = pearlite-ferrite and 100-50 = 50 per cent. ferrite.

If, on the other hand, the entectic is hyper instead of hypo, that is, if the total carbon exceeds 0.90 per cent., the excess over and above the pearlite present will be cementite under slowly cooling conditions in the freezing process, and then it may be said, all that is not pearlite will be cementite in the hyper-entectic, just as it may be said, all that is not pearlite is ferrite in the hypo-entectic

Cementite responds to the formula Fe_2C and satisfies the derivation, Cementite $= \frac{3\times56+12}{12}$ in a hyper-entectic,

When

12 = the atomic weight of carbon.

50 = the atomic weight of iron.

Hence,

$$\text{Ferrite} = \frac{3\times56}{12} \text{ in a hyper-entectic.}$$

For each one per cent. of cementite in the matrix can be resolved as follows:

$$C = \frac{1\times12}{56\times3+12} = 0.0667 \text{ per cent. carbon per one per cent. of cementite.}$$

Whereas of cementite it may be said the carbon therein may be found as follows:

$$Fe_2C : C = \frac{12\times100}{56\times(3+12)} = 6.67 \text{ per cent.}$$

Pearlite, the name given a certain formation involving carbon products as steel and cast iron, consists of ferrite and cementite in certain proportions. Pearlite is said to be the sole product of steel under normal conditions of freezing, if the carbon content is 0.90 per cent. Carbon is, therefore, present in this pearlite in the cementite and ferrite formation, and according to Howe, the cementite of the pearlite formation holds at about $0.90\times15 = 13.5$ per cent., and if pearlite is a name for the condition obtaining with the micro-structure in mind, the ferrite portion must be $100 - 13.5 = 86.5$. (Howe: Iron, Steel and Other Alloys, Second Edition, p. 183.)

In the hypo-entecloid product, excess ferrite holds in the proportions as before stated, but in the hyper-entecloid formation it is excess cementite that will be found. Considering the hypo-entectic a little further, it will be well to point out that whilst the relation of excess ferrite to pearlite may be resolved by direct proportion, yet even so, the matter is acceptable of lucidation in what might be termed a more satisfactory way as follows:

Total carbon × 15 = cementite; with the cementite, ferrite will be associated, cementite × 6.4 = ferrite, in the form of pearlite, and the sum of these equals the pearlite, whilst the remainder from 100 per cent. will be excess ferrite.

An example of this will make the matter more clear which, for illustration, 0.45 per cent. total carbon in steel may be taken, hence:

$$45\times15=6.75=\text{cementite.}$$

And

$$6.75\times6.4=434.20=\text{ferrite.}$$
$$6.75\times443.20=49.95=\text{pearlite.}$$

Now

$$100-49.95=50.05 \text{ per cent.}=\text{excess ferrite, usually taken as 50 per cent.}$$

Right here attention may be called to the very reason why in cast iron it is the condition of the combined carbon and the total thereof that renders the cast iron soft to work and reliable in service, although, as before stated, the graphite will be a maximum for a fixed total carbon content, under the very conditions that render the excess ferrite equal or nearly equal to the pearlite.

It has been said that the fixed carbon in the cast iron for cylinder work should not exceed 0.75 per cent., and it will be obvious that any increase in the fixed (combined) carbon will be at the expense of excess ferrite because excess ferrite decreases as the total combined carbon increases, which to illustrate, an example may be taken involving, say, 0.75 per cent. total combined carbon.

Hence:

$$.75\times15=10.25 \text{ cementite.}$$

And

$$10.25 \times 6.4 = 65.60 \text{ ferrite.}$$

Therefore:

$$65.60 + 10.25 = 75.85 \text{ pearlite.}$$

And

$$100 - 75.85 = 24.15 \text{ per cent.} = \text{excess ferrite.}$$

At a glance it may be seen that by increasing the combined car-

CHEMICAL COMPOSITION			
CARBON	TOTAL		3.61
	COMBINED		0.74
	GRAPHITE		2.87
	FERRITE		
	PEARLITE		
	CEMENTITE		
Cr.		Ni.	
V.		W.	
Mn.	0.59	Si.	1.34
Al.		Cu.	
S.	0.089	P.	0.62
Sn.		Zn.	
Pb.		Sb.	
As.			
PHYSICAL PROPERTIES			
T.S. / E.L.	LBS. PER SQUARE INCH		19800
EX. / CO.	PER CENT.		
PROOF	DIAM."		
	LENGTH"		
FRACTURE			
RATING	U.		
	H.		
TREATMENT			

SUBJECT: GRAY CAST IRON

NUMBER: 111 MARK:

FROM FULTON FOUNDRY & MACHINE CO NEW YORK 4-17-07 19

5.6 M. SIMPLEX 75 H.P. MOTOR CYLINDER 6½" BORE 6¾" STROKE TIGHT AGAINST 500 LBS. PER SQ. INCH HYDROSTATIC PRESSURE

COMBINED CARBON WITHIN THE LIMIT.

SULPHUR WITHIN THE LIMIT

MANGANESE WITHIN THE LIMIT.

PHOSPHOROUS ABOVE THE LIMIT.

SILICON ABOVE THE LIMIT.

CHEMICAL COMPOSITION			
CARBON	TOTAL		3.38
	COMBINED		0.58
	GRAPHITE		2.80
	FERRITE		
	PEARLITE		
	CEMENTITE		
Cr.		Ni.	
V.		W.	
Mn.	044	Si.	1.78
Al.		Cu.	
S.	0165	P.	?
Sn.		Zn.	
Pb.		Sb.	
As.			
PHYSICAL PROPERTIES			
T.S. / E.L.	LBS. PER SQUARE INCH		
EX. / CO.	PER CENT.		
PROOF	DIAM."		
	LENGTH"		
FRACTURE			
RATING	U.		
	H.		
TREATMENT			

SUBJECT: GRAY CAST IRON

NUMBER: X MARK:

FROM: MERCEDES CYLINDER

NEW YORK 4-17-07 19

THE PHOSPHOROUS WAS NOT NOTED.

THE SULPHUR EXCEEDS THE LIMIT.

THE SILICON EXCEEDS THE LIMIT.

THE MANGANESE IS WITHIN THE LIMIT.

THE COMBINED CARBON IS WITHIN THE LIMIT.

bon to 0.75 per cent., the excess ferrite fell off 24.15 per cent., whereas with the 0.45 per cent. carbon the excess ferrite was 0.50 per cent.

If excess ferrite is increased by decreasing the combined carbon, it might be argued that the fixed carbon content might be reduced to a low point, far lower in fact than the stated desired limit of 0.75 per cent. Unfortunately for any such theory, two things are against it.

(a) Combined carbon adds strength in some proportion to the amount present.

(b) Graphite enmeshed reduces strength in some proportion to the amount present.

Were no graphite present, the combined carbon would add about 800 pounds per square inch for each 0.01 per cent. of the same present and the then steel would be far stronger than cast iron with the same value of the combined carbon, and the relations of strength in the two products would approximate the following:

TENSILE STRENGTH IN POUNDS PER SQUARE INCH.

50 carbon steel.....105,000
50 combined carbon cast iron.....25,000

True, the tensility of the respective products might vary over broad ranges for various specimens and reasons, but the relation holds, nevertheless, for both products can be varied equally in per cent.

Cast iron holding about 0.10 combined carbon would have a tensile strength of not far from 15,000 pounds per square inch, if the total carbon be the same as in the case of the 0.50 per cent. combined carbon above cited. In this an illustration of the ills of excess graphite is quite apparent since a loss of 2-5 of the tensile strength is a good approximation.

Any attempt, then, to solely attribute good qualities and softness to excess graphite must be regarded as on slim grounds, nor would low combined carbon be a desirable condition. What seems to be best is that quality of combined carbon that holds excess ferrite about equal to pearlite, and if this contention can be substantiated, carbon (combined) should not exceed 0.50 per cent.

The relation of combined carbon to graphitic carbon would seem to be of great importance, for with a low value of the total carbon, low carbon seems to afford a good strength but good castings are not assured. For cylinders, good castings must be of the first importance, and on this account adjusting the relation of graphite to combined carbon, with a view to depressing the total and the combined carbon, holds out no great promise.

This phase of the subject, then, is not one for more than mention, but the combined carbon can be as low as 0.0275 per cent. with the total carbon as low as 2.75 per cent. and still realize fully 25,000 pounds per square inch tensile strength, but the silicon would be very high in such products and the fiuidity would be the only claim to be made in its favor.

If, then, the question is to be confined to the question of automobile cylinders, pistons, etc., it will be of no avail to discuss the uses and advantages of high silicon, low combined carbon mixtures, or in fact any of the many variations that could be brought about, provided assurance be given that no such variations would evolve better cylinder castings than those obtainable under the conditions fixing the limits of the components as herein before given with the understanding that within the given limits certain variations will obtain for diverse reasons, as:

(a) differences in the "pig" iron.
(b) differences in the "scrap" iron.
(c) differences in the relation of the "pig" to the "scrap."
(d) differences in the fuel.
(e) differences in the slag forming part of the charge.
(f) differences in the cupolas.
(g) differences in the blowers.
(h) different management.
(i) different time of teeming.
(j) position of the part of the charge used for cylinders, the first and last of the charge being the least desirable.

All these sources of variations are besides the question of gating, patterns, cores, sand, the "gaffer" and the rest.

If variations will be likely, the question of the effect of variations should amount to something more than to be disregarded. Briefly, the effects of the components besides carbon can be set down, viz.:

Phosphorus causes weakness to combat shock loads, and is manifested in the way of a decided "cold short" tendency that cannot be disregarded.

The ills of phosphorus are more apparent with high combined carbon than with low, so that decreasing phosphorus should be the rule with increasing combined carbon. In special automobile steel, for illustration, the phosphorus is fixed as a decreasing value with increasing carbon.

Phosphorus, fortunately, has a certain beneficial effect by way of producing good castings, and the aim should be to fix the phosphorus at a point giving the advantages of its presence, yet withal so low as not to render the casting "cold short." In the finished product this value is fixed as 0.50 per cent., which in itself limits the phosphorus content in the pig as that amount leaving not more that 0.50 per cent. in the casting. Phosphorus seems to afford, not so much fluidity, but the property of remaining fluid. To what extent phosphorus affords this property is not so well defined, since silicon seems to argue fluidity itself, and on this account silicon is likely to abound in castings in excess of that amount considered desirable from the purely strength point of view. Phosphorus has the property of reducing shrinkage and this in itself is a desirable property, since intricate castings, in the event of excess shrinkage, would alter their section, in compressing cores, or leave dangerous internal stresses.

Phosphorus in iron abounds, as a rule, in excess of the requirement, and the real problem is to limit phosphorus rather than to make any effort to render it high enough to afford the due measure of the good that it holds in its qualities.

In cylinders or other castings of an uneven thickness of walls or with large bosses or other proturberances, the phenomenon of unequal cooling must of course be taken into account, and two evils are likely to obtain as a result. * * * *

COMPLICATIONS OF LIMITED FUEL RACES

RUNNING an automobile race on a limited supply of gasoline at first sight appears to be an affair of angelic simplicity. The same amount of fuel is poured into each tank and that is the end of the matter. In practice, however, the simple method is not simple at all, but one far more complicated and difficult of application than the old regulations under which each car, after being brushed down and having its tanks emptied, had to be put on the scales, have all its parts verified, sent to race, and put through the same close inspection when its day's work was done. The Automobile Club of France made the experiment in this year's Grand Prix and will continue it in the Press Cup race, but has already decided that, notwithstanding good technical results, the trouble is too great for every-day usage.

Gasoline, like other bodies, is variable according to the temperature, and, after deciding that fifty gallons shall be allowed for the race, the question of density comes up for settlement, as well as the problem of how to supply every machine with fuel of the same value, for it is evident that if one car were filled with gasoline at 10 degrees it would be in a better position than one having been given the same number of gallons at 24 degrees. By dilation the gasoline would have increased in volume for a difference of temperature of fourteen degrees to the extent of more than five pints.

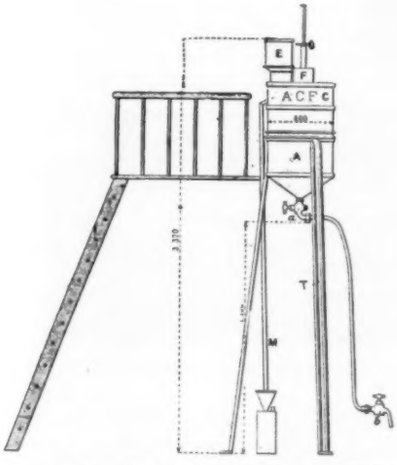


FIG. 1.—Elevation of fuel-measuring apparatus.

In order that every competitor should receive the same treatment, a very special type of tank had to be constructed for measuring the gasoline allowance to the Grand Prix racers. The work was entrusted by the racing board and technical committee of the A. C. F. to the Alpha Company, the French firm of searchlight and automobile lamp manufacturers.

The accompanying illustrations, which are reproduced from *Omnia*, show the nature of the measuring apparatus, five of which were used on the Dieppe circuit, three being for the Grand Prix machines and two for Sporting Commission cup racers. A metal gasoline tank (*A*) is mounted on stout trestles (*T*) and has an outlet at its base through the tap *a*, to which is connected a flexible tube with the cock *b* at its extremity. On the upper part of the apparatus is fixed a collar (*C*), on which rest a funnel (*E*) and a cylindrical volume regulator, which for the convenience of description might be called a compensator. The lower part of the funnel *E* had an outlet shaped to fit the mouth of the tank, and has a volume calculated to receive ten liters at a time, gasoline in France being uniformly handled in stores and garages in sealed cans of this capacity.

The compensator *F*, 7.2 inches in diameter and 12.2 inches in height, was constructed in such a manner that a variation of volume of the 231 liters of gasoline in the tank, due to either increase or diminution of temperature by one degree, correspond to a correction in height of ten millimeters. This correction had been calculated on the apparent co-efficient of dilation of gasoline contained in a galvanized iron tank.

To give each car its 231 liters (about fifty gallons) of gasoline to which it was entitled for the race, the following process was gone through: Cocks *a* and *b* being closed, the temperature of the gasoline ready to be poured into the 231 liter tank was obtained by means of a special apparatus, which will be described later, and the compensator *F* raised or lowered in the mouth of the reservoir *A* in such a way that the figure corresponding to the

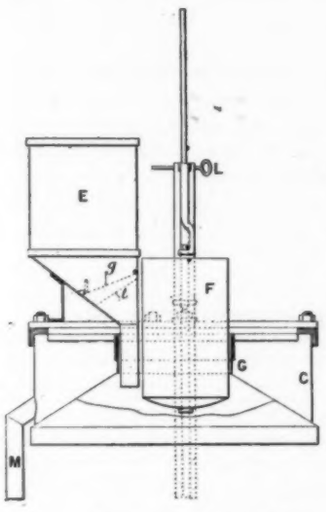


FIG. 2.—Funnel and volume regulator.

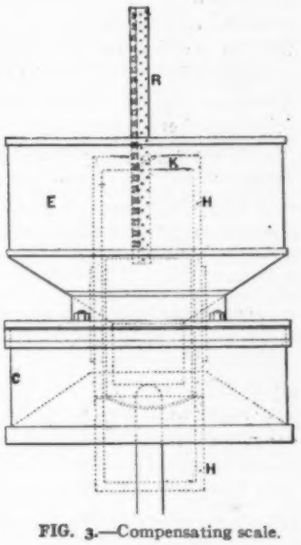


FIG. 3.—Compensating scale.

temperature could be read by the scale *R* attached to the compensator and the cross-member *K*, placed on the guide from *H*, as seen in Fig. 3. A key (*L*) then held the compensator in position, this operation increasing or diminishing the volume of the tank, according to whether the temperature of the gasoline was higher or lower than 15 degrees.

When the gasoline began to appear in the mouth of the funnel the temperature was again taken, and, should there be any variation, the necessary correction of volume was made by means of the compensator. The thermometer was then withdrawn and the tank filled until the fuel was level with the top of the inlet *G*. An overflow leading to a tank on the ground allowed of the tank being filled very accurately. All that now remained to be done was for the two cocks to be opened and the gasoline allowed to flow into the tank of the car and the special reserve cans provided for each entrant. A complete emptying of the measuring tank was assured by its conical base. Provision was made for straining the gasoline by a fine gauze in the base of the funnel, with a metal grating above it to prevent deterioration.

For a long time the technical committee was unable to find an instrument which would give an accurate reading of the average temperature of the mass of liquid. The apparatus finally adopted was a mercury thermometer *T* (Fig. 4), with graduations marked on its stem, contained within a copper cylinder *C*, and passing through the cork plug *B*. Two other openings were made in the cork plug, one serving for the passage of a copper tube *A* eight millimeters in diameter, and descending almost to the base of the instrument, and the other an opening four millimeters in diameter for the passage of gasoline. The thermometer was maintained by a stay at *F* and the apparatus provided with a chain sufficiently long to allow it to be dropped to the bottom of the

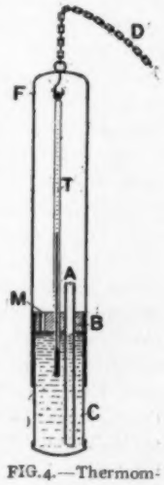


FIG. 4.—Thermometer.

tank. When the instrument was drawn out of the tank the gasoline which had passed in through the tube *A* ran out through the hole *M*, bathing the thermometer in its passage and recording the average temperature of the liquid without any evaporation whatever.

In addition to the measuring apparatus it was necessary to closely examine the interior of the gasoline tanks of the cars for hidden fuel. For this purpose a special electric lamp was devised and attached to the end of a flexible cane in such a way that it could be made to explore every corner of the tank. The eyes of the controllers not being as flexible as the canes, other rods were supplied with cotton pads at their extremity, which, being pushed around in every quarter of the tank, gave additional assurance that no gasoline remained within.

Everybody was satisfied at the manner in which the gasoline allowance was distributed, each detail being worked out so carefully that there was no possibility of cheating or unjust treatment. It is a delicate operation, however, and unless there is a perfect organization races run under this basis are likely to give rise to endless controversy. The French club was so unanimously of opinion that the method would give rise to difficulties that it was decided not to use it after this year.

CUSTOM REGULATIONS GOVERNING AUTOS.

WASHINGTON, D. C., July 30.—Collectors of Customs have been notified by Assistant Secretary of the Treasury Reynolds that new regulations governing automobiles taken abroad by tourists have been formulated. The new regulations provide that the owner of an automobile of foreign manufacture on which duties have been paid may, after its identification and the issue of a certificate by customs officers, on his application, take it abroad for touring purposes, with the right of free entry on its return with him, or within thirty days thereafter, provided that no repairs, improvements or additions were made to the automobile, except absolutely necessary repairs costing not more than 10 per cent. of the original appraised value.

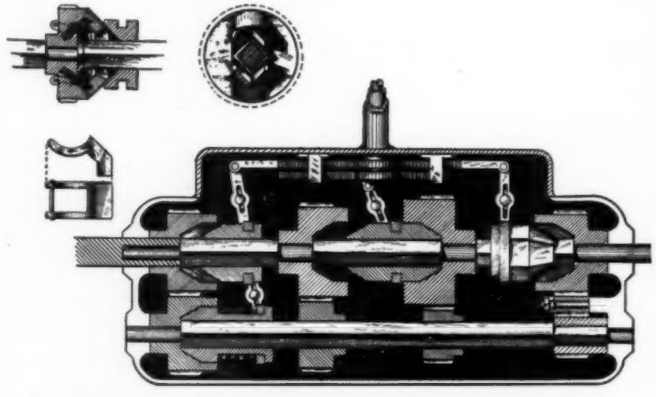
Accessories of foreign manufacture will be exempt from duty in connection with the automobile, provided that it shall be established that they were the ones taken abroad under the certificate. If the certificate covers a set of foreign tires, it will not be necessary to prove that the tires brought in on the wheels were those taken abroad.

Certificates will be issued, on request, for automobiles of American manufacture and their accessories, and such automobiles, whether or not under certificate, will be admitted on their return, free of duty, provided that they shall not have been advanced in value or improved in condition, and that all repairs thereto were absolutely necessary and did not cost more than 10 per cent. of the original price of the car. The further provision is made that it shall be shown that the accessories are those taken abroad under the certificate. Such repairs shall not be deemed an advance in value or improvement in condition within the meaning of Section 483 of the Tariff Act. Duty will be charged on any accessories of foreign manufacture which shall be substituted abroad. Foreign tires taken out on the wheels of automobiles may be brought back free of duty.

The regulations further prescribe that the owner must make oath and the Collector of Customs must be fully satisfied that they come within the regulations before any such automobiles and accessories shall be admitted free of duty. In case of the unavoidable absence of the owner when an automobile and accessories are entered either under a certificate, or without one, or entered as household effects, the duly authorized agent of the owner may give a bond in amount equal to double the estimated duties condition for the production to the Collector within sixty days from the date of entry of evidence to the satisfaction of the Collector, with the oath of the owner that they are entitled to free entry. This bond may be extended by the Collector for a total period not exceeding six months.

INDEPENDENT CLUTCH CHANGE-SPEED GEAR.

One of the most obvious methods of overcoming the very objectionable necessity of sliding gears into and out of mesh while revolving, which constitutes the chief drawback of the style of change-speed gear now in present use, is to design the mechanism so that the relative position of the pinions remains unchanged while they are brought into and put out of action by means of independent clutches. This expedient naturally suggests itself at once and it has been tried in numerous instances, but not with that measure of success that it would seem to hold at first sight. The accompanying illustration depicts a novel modification of the idea, employing conical clutches operated in a manner somewhat similar to that known as the selective type of gear-changing. It will be noticed that the high speed or direct drive is thrown in by means of a lever which is also connected to the clutch just below it on the countershaft at the left, so that throwing in the high speed disengages this clutch, leaving it, as well as all the remaining pinions, idle. As shown in the illustration, the gear is set to give the first or slow speed, the spring shown on the countershaft being employed to allow additional motion of the rack into reverse, as the latter is controlled by the same rack. The claims of the patentee, Frederick S. Leonard, Jewett City, Conn., permit of several detailed modifications, which may be embodied in the device should experience show them to be superior to those shown in the drawing. For instance, the hexagonal faces of the clutches shown might be replaced by conical, corrugated faces, thus doing away with all square corners, with their tendency to wear round and slip in time. Another type of individual clutch which may be substituted if thought fit is shown in section in the upper left hand corner. It is a simple and positive lock, the clamps for engaging the square sections of the shaft having extensions passing through the pinion on a curve, so that when released the helical springs force the clamps out and the curved groove lifts them clear of the shaft. When pressed into place by the sliding block on the shaft they instantly lock the pinions to the shaft and, being reinforced by the sides of the wheel, no serious strain is brought upon any particular part of the mechanism. The shaft can be made round and in one piece, while the short section of square shaft needed under the clamps can be slipped on and keyed to shaft proper. The sliding block is left free, so that only that particular part of the gear set that happens to be in service at the time is revolving, all other parts remaining idle.



SECTIONAL PLAN VIEW LEONARD CHANGE SPEED GEAR.

One of the last things that the amateur driver learns to let alone is the carbureter. He seems to regard a bit of adjustment here and there, particularly where the gasoline flow is concerned, as a sort of panacea for all the ills of irregular running. In many cases the original trouble is wholly imaginary, but a little inadvised tinkering with the carbureter adjustments makes it real in a very short time, so that it pays to let the carbureter alone except when it is obviously at fault.

LETTERS INTERESTING AND INSTRUCTIVE

Various Types of Pumps Employed on Automobiles.

Editor THE AUTOMOBILE:

[839.]—Will you kindly let me know through Letters Interesting and Instructive, the following: How many kinds of rotary pumps are there in use beside the gear pump and the type used on the Pierce-Arrow that are employed as circulating or lubricating pumps and kindly describe the principles of each type briefly.

Also the following with reference to the fans ordinarily employed to assist in cooling the motor. How is the volume or amount of air put in circulation by such a fan calculated? That is, the fan formed by the spokes of the flywheel and forming a part of the latter, as well as the independent fan placed directly behind the radiator, when both the dimensions of the fan and its speed of rotation are known. AUSTIN M. WOLFF.

Stamford, N. Y.

There are three types of rotary pumps in general use on the automobile, the gear-pump which you mention, the centrifugal pump and the rotary pump. The principle of the gear-pump is practically that of the piston or plunger pump in which an increase of volume, *i.e.*, the receding of the piston draws the liquid into the pump and the decrease of that volume by the return of the piston forces it out. In the gear pump the volume is increased and decreased alternately as the pinions revolve. As its name indicates, the centrifugal pump depends for its action on centrifugal force; in the gear pump the liquid enters at one side and leaves directly opposite, while in the centrifugal pump it enters at the center, the pump housing being circular. The water strikes the center of the moving member of the pump, which revolves at high speed and is thrown to the circumference by centrifugal force, the outlet being placed at the top of the casing. The rotary pump works on the principle of the simple waterwheel; its spindle carries a number of vanes, the water entering at one point on the circumference of the housing and leaving at another diametrically opposite, the former usually being at the bottom so that this pump is practically an undershot water wheel except that being driven by power and confined in a casing it carries the water round with it and out at the top, instead of being impelled by it. The centrifugal pump is the type most generally used on automobiles with the gear type next in favor, the rotary not being often found on present-day cars.

The method of calculating the volume of air delivered by a fan will be found in Kent or other engineers' pocketbooks under this heading, but the data is too voluminous for reproduction here. While there are doubtless exceptions, we are under the impression that the average fan used on the automobile is largely a matter of guesswork and that neither science nor overmuch calculation enters into its makeup. The same applies to the flywheel fans you mention, though we understand that this is a matter that is now coming in for considerably more attention at the hands of the designer than it has hitherto been customary to devote to it. A fan was a fan and that was all that was necessary owing to the relatively minor rôle it was called upon to play in the power plant.

Inquiries About the Holley High-tension Magneto.

Editor THE AUTOMOBILE:

[840.]—Some weeks ago I read an account of the Holley system of ignition in "The Automobile," in which it is stated that an electric condenser is employed in connection with a magneto. Can you give me the maker's address, as well as the number and date of his patents covering this system? ARTHUR GRAHAM.

New York City.

You will find the announcement of the manufacturers of the Holly magnetos in our advertising columns and we would refer you to them direct for the information you desire. If you do not wish to correspond with them on the subject, the data you inquire about is a matter of public record and can be found by looking back through the *Patent Gazette*, which is kept on file at public libraries such as The Astor.

In Settlement of Two Disputed Questions.

Editor THE AUTOMOBILE:

[841.]—Perhaps you will be good enough to settle an argument I have had with my chauffeur. We have had some trouble with a slipping cone, leather-faced to metal clutch. The first leather not holding, I sent for another, and on taking the first one out I found that the leather was lifeless, having been burnt up with the great heat caused by the friction.

When putting the new one in my chauffeur stated it would have to be soaked in castor oil, but I told him that we would have the same trouble again, as castor oil was a good lubricant. He assured me though that "the leather must be well soaked," otherwise it would be very "fierce," so I let him go ahead and he soaked it thoroughly and thickly with the castor oil. The first few minutes we were out we found it slipped a little, but with the increasing heat of the engine (just as I expected) the oil exuded, and in a little while it could not move the car on the level, as the engines raced and the clutch would not hold.

My chauffeur then said that the clutch was too small, but I assured him that any clutch would be too small if he put enough of oil and grease between the leather and the steel, and that the action of oil on the leather was exactly the same in every way as reducing the size of the clutch. In other words, the effect on the transmission and the engine was precisely similar, because a small clutch not oiled would slip, and a large one with oil would also, and that the same effect was produced by a weak or a strong spring at the back of the clutch, i. e., that a weak spring at the back of the clutch was precisely equivalent in every way to a small clutch or a large one well oiled. Will you kindly decide if I am right in this.

Another point about which I have had some argument is the effect of a magneto. In a case where a magneto is set to spark before the piston arrives at the dead center and thereby the explosion immediately after it passes it, the engine going at, say, 1,000 revolutions per minute, would not the explosion come when the piston is on the dead center if the engine was running very slowly?

My argument is that there is an instant of time between the spark and the explosion, and in that time the piston travels a more or less distance, according to the speed at which it is going.

My chauffeur holds that as the spark is set by the position of the piston, then the explosion must always take place with the piston in the same position, whatever the speed, and, therefore, if it does not explode on the dead center when the engine is running at 1,000 revolutions per minute, it could not take place there when the engine is going at 100 revolutions. Which is right?

Thanking you in anticipation for your kind reply.

Toronto, Can. AMATEUR MECHANIC.

Regarding the first matter in dispute, while castor oil is a good lubricant, it also has the peculiar property of causing a leather surface to adhere to metal and on this account is largely used, or was in former years to apply to slipping belts in factories in order to make them cling to the cast-iron pulleys on the shafting. In fact, it is a belt-dressing of many years' standing and has long been used to keep the leather from drying out and becoming hard. There is little doubt that a leather clutch facing which was given a preliminary soaking in castor oil would not only act better but would be apt to prove more durable in the long run. It is only natural that a large part of the oil should be forced out in operation but sufficient would remain to keep the leather in a more pliable condition than if it were used dry. It would seem as if the trouble lay in a weak spring rather than in the facing of the clutch. On the other hand, you are quite correct in holding that the clutch, *i. e.*, the male member of it, is not too small, as if this were the case it would have been a source of trouble from the outset. Such a clutch would be apt to slip under any circumstances, but putting castor oil on a clutch of the proper dimensions should not cause it to slip once the excess oil has been squeezed out of the leather. The "increasing heat of the engine" to which you refer is not a factor in such cases ordinarily, as the clutch is situated sufficiently distant from the engine not to be appreciably affected by its heat. The heat which did the damage was that of the friction generated between the slipping leather face and the flywheel recess of the clutch, a state of affairs which, under the

circumstances, points to the presence of a spring that is not sufficiently strong to seat the clutch properly so that it will slip and cause trouble whether oiled or not.

A magneto is usually set to run synchronously with the engine to which it is attached and in timing it with the latter allowance is made for this difference in the time of the occurrence of the spark at the magneto and that of the explosion, which, though appreciable, would be a diffcult matter to measure and constitutes but a small fraction of a second. However, as the piston of a motor turning over 1,000 r. p. m. can travel quite an appreciable distance in the same period of time, the necessity for the allowance will be appreciated. The position you take is quite correct, though you are probably not aware of the basis for it. This is to be found in the fact that the magneto is said to "build up" as its speed increases. Technically speaking, both its current output and its potential rise proportionately with an increase in speed, and particularly the latter. In other words, it acts much more quickly at a high speed than when turning over slowly, as is true of all current-generating machinery. This being the case, if the magneto were timed to fire the charge at a position corresponding exactly to the upper dead center of the piston when the motor was only turning over at 100 r. p. m., the charge would be fired considerably in advance of this point when the motor was running at 1,000 r. p. m., and this is exactly what is desired, as the piston naturally travels a much greater distance in a given space of time when running at high speed than it does at a low speed. The occurrence of the same interval at the higher speed as takes place at the lower rate, would naturally cause the piston to run away from the spark, so to speak, which would have to be counteracted by setting the spark advance lever further forward.

A Loose Piston Pin Caused This Hammering.

Editor THE AUTOMOBILE:

[842.]—Some time ago I wrote a letter (822) to "The Automobile" asking you for information which might lead to the discovery of a hammering noise in my engine that was troubling me. I gave as full an explanation as possible, but doubtless it was not entirely clear or you would have been able to locate the trouble. However, I had found my trouble before your reply was published and had reached me, so thought it might be of interest to you and to any who might be troubled that way to know where the trouble was and how we located it.

After examining the engine as closely as possible, we found which cylinder was the center of the trouble, then removed it so as to be able to get at the connection of the piston in an easy manner. We found upon further investigation that the piston pin was loose, giving enough lost motion to cause considerable of a pound and also a great loss of power. We took up the lost motion by removing the pin and pounding the same very hard on one end, the other end placed on a solid vise. This treatment enlarged the pin sufficiently, so that there was no more lost motion. From that time the engine has run fine and has the original amount of power.

I would like to make another inquiry and hope you can give me some assistance through your Letters Interesting and Instructive. I will try and give a good description of the trouble. I have a Model C Ford 10-horsepower engine, double cylinder. The engine has been in use for three seasons. The engine is doing as good work as I could expect, but the valves seem to make an unusual and unnecessary amount of noise. Is there any way whereby this could be improved on or stopped?

Tracy, Minn. C. B. PARTRIDGE.

While our diagnosis of some of the problems submitted us for solution frequently goes wide of hitting the mark, this would hardly seem to be true in your case, as if you will refer to our answer to your former letter you will find that the opening sentence of this stated as explicitly as we could make it do so, that, in our opinion, the trouble was caused by looseness at either end of the connecting rod where it joins the crank pin or the piston pin. Your description was perfectly clear and, as subsequent events prove, we did locate the trouble, mentioning, moreover, that your statement of the case was an "almost certain indication" of the cause you discovered to be at the root of the trouble. We are glad to hear that you were able to find it and apply the remedy before our reply reached you, and the manner in which you made it good may prove of interest to others, although the method employed was decidedly crude and rather to be avoided than patterned after in similar cases. If after upsetting the pin in the manner you describe it had been turned down true to its bearing again, no fault could be found with the repair, but the use of a brass bushing would have made a better job where lathe work was not convenient.

Regarding your second inquiry, probably the only way to bring about an appreciable reduction in the amount of noise caused by the valves of your engine would be to replace them with new ones, as the trouble is doubtless due to the fact that the valves have been worn considerably by grinding in and the tappet ends have also worn, the first permitting the valve to drop much further before reaching its seat and the latter bringing the tappet and push rods together with more noise owing to the increased distance between them.

Spur and Bevel Gear Differentials Compared.

Editor THE AUTOMOBILE:

[843.]—Will you kindly explain in the columns of your valuable journal the advantages and disadvantages of the spur gear and the bevel gear type of differentials? I have noticed that some machines which otherwise are constructed greatly the same differ in the type of differential, and each dealer claims that his is the only type of good construction. One dealer told me that many manufacturers who had tried the spur gear had gone back to the bevel gear. Why the spur gear is not an improvement over the other in not having the tendency to push the case apart is beyond me, so I have referred the question to your higher court.

Minneapolis, Minn. RAYMOND O. WEISS.

The bevel type of differential is very generally used nowadays except on small, light cars, and there are several reasons for preferring it. Chief among these is the fact that some relative movement of the driving axle of a shaft-driven car is bound to take place; that is, under the stress of passing over rough roads the two halves of a live rear axle are compelled to assume slightly different planes instead of remaining in the same plane as when standing. Considered as one piece, the axle may be said to bend at the center. Bearing in mind the nature of a spur-gear differential, it will be apparent that under such circumstances the small pinions lying parallel with and meshing with the large pinions on the ends of the axle as well as with each other, will tend to bind. If there be sufficient relative movement of this kind between the two parts of the axle this binding will naturally become a serious factor until it reaches a point where the teeth strip.

This brings us to another advantage of the bevel type—the latter will not only automatically compensate for any amount of this so-called bending short of actual destruction, as it rolls round a point, but it is also proof to a much greater extent against stripping of the teeth as the design of the latter permits of their being made with a larger cross section. The bevel differential is much more silent when new and it maintains this advantage throughout its useful life as wear may be compensated for by adjustment, bringing the bevels and the members with which they mesh into closer contact to the extent to which they have worn. The dealer who told you that makers who had tried the spur type had later abandoned it in favor of the bevel was quite correct. Regarding the tendency of bevel gearing to push the engaging members apart, in this instance, the sides of the housing, this is readily overcome by the use of suitable thrust bearings, usually of the annular ball type and very little difficulty is experienced on that account. Thus the bevel differential has the advantages of greater efficiency, greater freedom from accident and silence in its favor, while it may also be made more compact.

Who Is the World's Greatest Racing Driver?

Editor THE AUTOMOBILE:

[844.]—Not long ago a friend and myself had an argument as to who was the world's greatest and most skillful automobile driver. My friend claims that Duray, the driver of the De Dietrich, is the most skillful in the handling of a racing car. Now I claim that Oldfield, though not a road driver, showed more skill in his races

on the local tracks than Duray or any of the other foreign drivers in the Vanderbilt Cup races. I base my argument on the fact that I watched the foreign drivers closely as they swung round the "hairpin" turn in the last cup race for the express purpose of comparing their driving with that of Oldfield, and my conclusion was that Oldfield was the most skillful. I would like your opinion on the matter. A reply through Letters Interesting and Instructive will be appreciated. A. W. LARKINS.

New York City.

Like similar questions concerning the most popular or the most beautiful actress, this is entirely a matter of personal opinion. The work of many of the foreign racing drivers shows masterly control of the car at high speeds and in bad places such as are not encountered in track racing, but opinions both as to the relative merits of different road racing drivers and their skill as compared with some whose sphere is confined to the oval, are so numerous and so conflicting that it would be a waste of time to attempt to reconcile them. We cannot lay claim to being an authority on the subject, nor can we refer you to any higher tribunal.

SOME INFORMATION FOR NUMBERS 797 AND 772.

Editor THE AUTOMOBILE:

[845.]—I note your reply to letter No. 797, C. C. Cross, in the issue of June 27, and it is possible that the matter might be stated in another way which may help him to understand the matter. Simply bear in mind that the term "point" means one one-hundredth part of one per cent., or one ten-thousandth part of the total mass. In the case which he cites this would be spoken of as 45-point carbon, it would mean that the carbon content was forty-five one hundredths of one per cent., or not quite one-half of one per cent. The sulphur is one and seven-tenths points, or seventeen thousandths of one per cent. The nickel is one hundred and seventeen points. As points indicate hundreds, it is readily seen that when coupled with the term points we read the first two figures to the right of the decimal point, as whole numbers indicating the points, and when there is a third figure, as is the usual case when sulphur, phosphorus, manganese, silicon and other elements are spoken of, it means tenths of a point. In all good metallurgical test work all elements are figured to tenths of a point, and it should be done in every case requiring accuracy.

In the matter of physical properties, Ex-4″ means the extension in the length of 4″, in this instance it is eight and one-quarter per cent.; in other words, it means that a space which was 4″ long stretched out to 4.33″ at time of rupture. As to the second abbreviation I see where he took it from and consequently he is not at fault, but what is intended, and the proper term to us is reduction of area, it refers to the cross-section of the test piece and has nothing to do with the length. As an example we will assume that the test piece was a round bar ¾″, or .750″, in diameter, the area would then be .441787″, we then pulled it to rupture and found the diameter at the break to be .713¾, this would be an area of .399273″, the reduction of area would be .042514″, or nine and one-half per cent. It might not be amiss to say that the first abbreviation should be elongation instead of extension.

This matter of a 4″ test piece brings up another phase of this question which is of interest, and it is hard to understand why some persons in the automobile industry are so ready to ignore the facts which the experience of years has taught. We test metals to secure facts, and it has been found that short pieces are misleading, the 8″ test piece has become a standard. We must not lose sight of the fact that when a test piece is pulled it never pulls evenly, its main elongation and reduction takes place in a space of about two inches in the center of the specimen; this being the fact, it is readily seen that a 4″ test piece gives us a wrong percentage of elongation.

In your issue of June 6, letter 772, the keyseat for a Woodruff is cut longitudinally, the same as for any other key. The "Rites" governor represents the best practice in modern high-speed steam engine work. The Corliss gear is not adapted to high-speed work, and the study of engineers to produce a gear which could be run at high speeds resulted first in the centrifugal governor, where weights in the flywheel are connected with the eccentric in such a manner as will change both its location and throw, and consequently the length of time that steam is admitted to the cylinder. The next step in this line was the "Ball" governor; he placed the belt wheel on the shaft so that it was free to revolve a certain amount, the spring of the centrifugal governor was attached to this wheel in such a manner as to pull it against a stop and in a direction contrary to the pull of the belt; under normal conditions the centrifugal governor controlled the speed of the engine, a heavy load resulted in a harder pull on the main belt, it rotated against the spring, increased its tension and consequently opened the valves. When this engine was first placed on the market it created quite a sensation, as its makers advertised that they were ready to install an engine which should run at constant speed regardless of load, or run faster when under a load than when running light; this was in direct opposition to all facts known in practice at that time, the loose wheel was an objection, but it is quite presumable that this was what started the train of thought that resulted in the "Rites" governor.

The "Rites" governor combines the effects of centrifugal force and also inertia; under a given load and normal conditions it controls the valve action the same as a centrifugal governor; when any sudden load, or reduction of load, comes on the engine, the inertia effect comes into play. I have never known of its being applied to gas engines aside from Thompson & Sons, Beloit, Wis., and I know nothing regarding the results they have secured, but they claim to regulate within two per cent.; they build quite large engines. EDWARD F. EDGECOMBE.

Cuyahoga Falls, O.

TO THE POINT ABOUT ALUMINUM CASTINGS.

Editor THE AUTOMOBILE:

[846.]—In "The Automobile" of July 18 there is an article on this subject by E. Blough that is the type of article that makes serious engineers so very, very tired. What real information is contained in it? His "say so" that his company can or has made castings having the characteristics given in the article does not amount to a "hill of beans" so far as real definite information is concerned. Why not give the composition, foundry practice and actual test records of specimens?

First we have a well-known engineer giving 9,000 pounds per square inch as the safe tensile strength to figure on. Then a prominent foundryman writes an article and says, in effect: "You're away off, old chap, we can give you castings with three times the strength of your rotten old test pieces and a real, live elastic limit; you surely got a 'bad one.'" Then, again, I know that this year another prominent foundry gave a well-known automobile manufacturer a fine lot of "punk" gear boxes, all of which have been renewed at the W. K. A. M.'s expense. In view of the above, "where are we at" on aluminum castings. Personally, I am sidestepping the question by using bronze, and incidentally keeping out of the bunco game.

There seem to be only two ways of getting good aluminum castings with certainty; either have your own foundry, or keep a bribe-proof, high-priced metallurgist as inspector at the foundry to watch every melting and pouring.

Mr. Blough's article is of the kind that says "now, I know, and you do as I say," but we have been "done" so often and so regularly on aluminum castings that articles like this only serve to create additional distrust and force us to an increased use of bronze. E. T. BIRDSALL.

Rochester, N. Y.

SHORT-CIRCUIT TRACED TO THE COIL BOX.

Editor THE AUTOMOBILE:

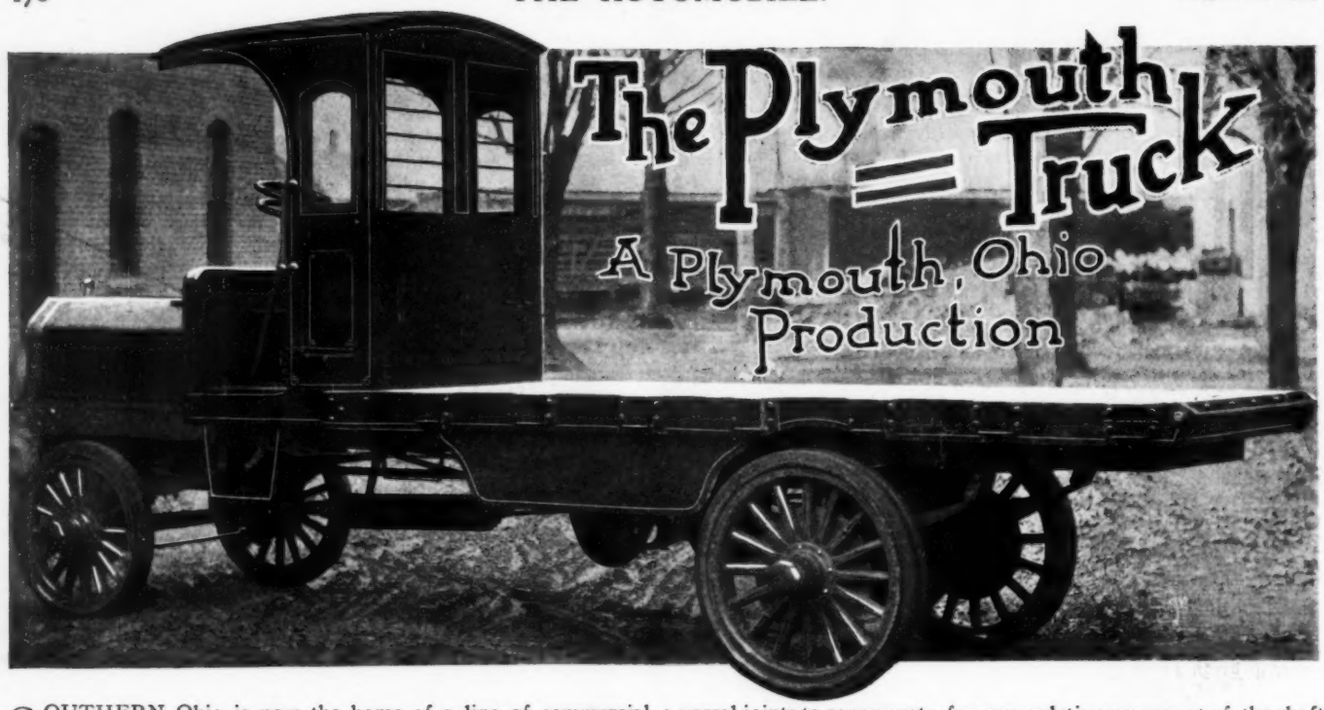
[847.]—I have just had an experience that may interest your readers. I was driving my four-cylinder car in a rain storm and after driving about five miles two cylinders misfired, and a hasty examination showed all vibrators working, clean spark plugs, commutator in good order and carbureter in the same condition. I was pretty confident that the trouble was merely of a minor nature—one of those little things that defy discovery at the time and which are all the more exasperating on that account—but one is not overmuch tempted to "fight it out on this line" on a black, rainy night when more or less in the dark in every way and even that most ignominious ending to a run, a tow, is a welcome relief.

After running a few miles on two cylinders the engine died entirely, and with all vibrators still working, disconnecting the terminals from the plugs and holding them near the plug ends, or close to the cylinder heads would not show anything but a suggestion of a spark, though at times I would receive a shock when handling the secondary wires close to the top of cylinders. At this time, it being in the night and raining, I naturally thought of broken wires or broken down insulation, as others have said was the fault when I have told them of the symptoms, and I sent for help and was taken in tow and brought home.

This morning I went over the wiring and found that two cylinders were in order, but noted that the plugs of the two cylinders that were not firing, when laid on top of the cylinders, each gave a faint spark simultaneously, which was an indication of a short circuit between them, and took one of the units out of the coil and found it wet at the bottom. This proved that the rain had penetrated the coil box in some way, causing the two coils to short-circuit by reason of the water forming a contact between them.

Such a condition is so unusual and baffling that I thought it would be worth while to mention it, and it may save someone else from being towed in if they remember reading about it.

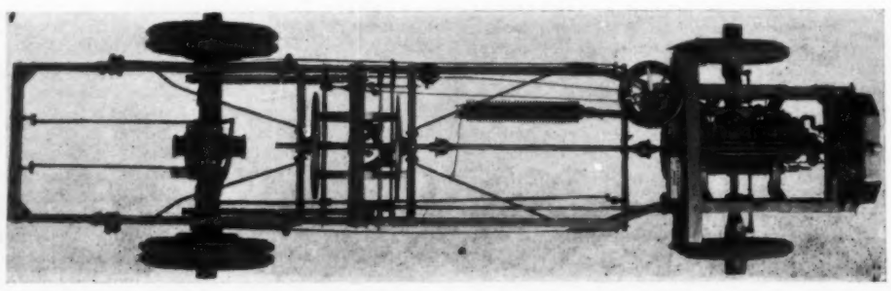
Lindsborg, Kan. A. E. AGRELIUS.



SOUTHERN Ohio is now the home of a line of commercial vehicles which in the course of the next season or two should prove eye-openers of no uncertain sort, provided their attainments measure up to the promise given by the first ones of their kind. They are built by the Commercial Motor Truck Company, Plymouth, O., and are known as the Plymouth cars. The power plant of the chassis at present being turned out consists of the well-known Rutenber four-cylinder motor with 5 by 5-inch cylinders. Ignition is of the high-tension type, employing a set of accumulators as the source of current, a Splitdorf multiple-unit coil and timer comprising the accessories, while the essential of lubrication is taken care of by a Hancock valveless automatic force-feed oiler, leads being taken to each of the cylinders independently as well as to the main bearings. In designing this power plant every effort has been directed toward making it the acme of simplicity in view of the service and lack of attention it would have to endure, as commercial trucks and sight-seeing cars more often than not fall into the hands of drivers who have but little appreciation of the needs of a piece of machinery such as an automobile motor. With this end in view every possible source of breakdown has been eliminated throughout, not alone the motor but likewise every other part of the car, so that a Plymouth truck may be placed in the hands of an inexperienced driver without fear of being stalled through petty defections, which, though never serious, nevertheless bring the car to a stop and cause a considerable loss of time as well as the services of a more expert attendant to go and supervise the repair. The liability of a truck to such failures also proves a potent attraction to the inexperienced hand to tinker, thus making the trouble far worse and frequently entailing other and more serious derangements than the initial cause of stoppage, which is often trivial.

The chief feature of the Plymouth cars lies in their transmission. This consists of two friction disks located just in front of the rear wheels and mounted on a shaft connected directly with the engine through the medium of two universal joints to compensate for any relative movement of the shaft and the body of the car. These disks are of cast iron, 25 inches in diameter and are faced with a 3/8-inch layer of aluminum alloy. Two friction-driven wheels are situated directly between the two disks just described, each being mounted on an independent shaft, and both being brought into contact with the friction wheels simultaneously. The rear disk is employed entirely for the forward speed and the other for the reverse. These friction wheels have their circumferences or contact surfaces equipped with a specially prepared tar filler, manufactured under great hydraulic pressure, and which when brought into contact with the aluminum alloy has an extremely high coefficient of friction, thus enabling the device to transmit a miximum amount of power without slipping with a minimum area of surface in contact, and likewise with a minimum of pressure between the contacting surfaces, thus rendering them far more durable than would otherwise be the case. The friction wheels are forced against the disks by means of a pedal.

Since these driven wheels are mounted on independent shaft and both are in contact with the same disk at the same time, they must necessarily revolve in opposite directions in order that the sprocket chains running from this divided shaft and which form the next link in the transmission of the power, will travel in the same direction. To accomplish this the sprocket on one side of the car, as shown in the full length chassis view, is driven by a spur gear operated from the divided shaft. It will further be seen that the power is transmitted from these sprockets to a corresponding pair somewhat larger in size, situated directly over the rear axle. These sprockets drive a countershaft at the center of which is an enclosed change-speed gear mechanism comprising sliding pinions and two large spur gears, the whole constituting a two-speed gear set giving a high and low speed. This manner of transmitting the power does away with the necessity of attaching any sprockets to the rear wheels, and the chains, moreover, are kept well up out of the mud and dirt, thus in-



CHASSIS OF THE PLYMOUTH TRUCKS AND SIGHT-SEEING CARS.

creasing the efficiency of the transmission in every-day service and making its proper maintenance an easier matter than under ordinary conditions.

Thus the Plymouth cars have two sources of high and low speed which may be used in conjunction with one another and which permit a great range of speed and power. Thus the speed of the two friction wheels depends upon their position on the face of the friction disk and they may be shifted at the will of the driver. Either speed can be used with either the high or low gear, the latter in connection with the high speed naturally being intended for heavy work and the high gear and high speed for light, fast work. The wheelbase of the vehicle, which may be fitted as an open stake truck, as shown at the head of the page, as 24-passenger sight-seeing vehicle or for any other similar commercial use, is 144 inches, tread 54 1-2 inches, the tire equipment being 32-inch single Firestone on the front and 36-inch twin Firestone solids on the rear. At present the company, which is well equipped to turn out these cars, is placing 20 to 40-passenger sight-seeing cars, 20 to 24-passenger 'buses, as well as flat and side-stake trucks, vans, and the like.

On a recent test of these sight-seeing vehicles the latter made a most successful run to Sandusky and return with a heavy load of passengers and under most adverse road conditions owing to rainy weather, some of the stretches being covered at a 20-mile-an-hour clip despite the bad going.

COMMERCIAL VEHICLE TRIALS IN ENGLAND.

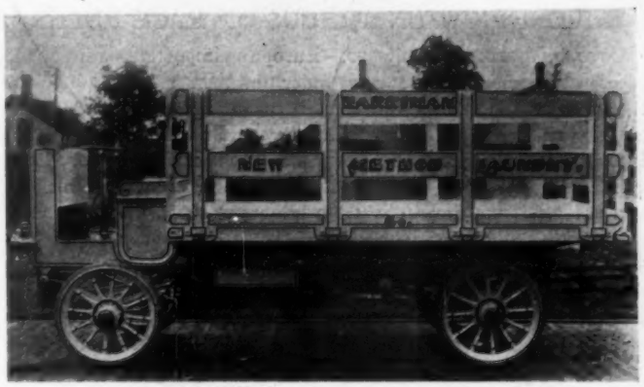
With the view to arousing public interest in and advertising commercial motors, the Royal Automobile Club, in connection, it is understood, with the Commercial Motor Users' Association, will hold, beginning September 9, trials of commercial vehicles, which will be in the form of a tour, reports United States Consul Albert Halstead, of Birmingham, Eng., regarding the British motor industry.

Manufacturers of the best lines of motor cars are reported to be exceptionally busy and to find their orders so numerous as to frequently necessitate delays in deliveries. Motor manufacturers are now confident that the sales this year will far exceed those of 1906, which were the greatest on record.

Concerning the standardization of parts used in the construction of motor cars, it is reported that the Institution of Automobile Engineers has appointed a committee, which is preparing to make a thorough inquiry into this question. It appears to be appreciated that for some time only those accessories and component parts used on engines of all types can be studied with a view to standardization, but it would seem as if nuts, bolts, bolt-heads and wrenches also deserve consideration. One difficulty in standardization is the fact that Continental motor makers use the metric system, while manufacturers in the United States and United Kingdom do not. It is understood, also, that a committee of the Society of Motor Manufacturers and Traders is making an investigation of the question of standardization. The fact that this subject is receiving attention is certainly important as a first step toward agreements that should be beneficial to the motor manufacturers of all countries.

EUROPEAN HOTELS AND MOTOR 'BUSES.

The motor post-service in South Tyrol, which worked last year so successfully, is being continued this year on a larger scale, says *The Commercial Motor*, of London. For instance, visitors get the benefit of a new line connecting up Neumarkt or Tramin with the popular health resort of Martino di Castrozza, and leading over the Rolle Pass, some 6,400 feet above sea-level. The route approximates to 44 miles, and passes through some delightful scenery. Ten-seat motor 'buses, in charge of men appointed by the military officials, who are greatly interested in the development, work the line.



A DOWN-EAST RAPID DELIVERER OF CLEAN SHIRTS.

NEW RAPID GASOLINE BUSINESS WAGONS.

One of the great advantages of the gasoline-driven commercial vehicle is the ease with which it lends itself to an endless variety of business uses. Whether it be transporting ponderous loads at a rate of speed not attainable by any other means, the haulage of medium heavy loads at a rapid rate or light delivery at a pace unknown to the business world before the advent of the gasoline car, the latter is equally valuable and not to be compared with any other current method of accomplishing the same ends. There is another side to the question also, as where the duty does not vary between any great extremes the same standard chassis is frequently applicable to both with equal advantage, merely a change of the body of the vehicle being necessary to adapt the car to the altered service.

This is aptly illustrated by the accompanying photographs, one of which represents a delivery wagon in the service of a New England laundry, while the other is employed daily by a Chicago creamery. Both are the product of the Rapid Motor Vehicle Company, of Pontiac, Mich., and both are mounted on the standard chassis built by this firm, the fitting of a body specially designed for the service in view of being the only difference between them, and it is evident that in both cases a roomy body, capable of carrying considerable load, is employed. The laundry wagon makes a daily round of thirty miles through the suburbs of Boston, while the milk wagon is employed in a similarly strenuous occupation in the confines of the Windy City, and, considering the miles of poor pavement in the latter, there is doubtless little to choose between the duty of each. The builders of the Rapid commercial vehicles construct cars for every form of commercial service, such as hospital ambulances, piano trucks, telephone service wagons, chemical fire engines and the like, illustrating the extremely wide range of uses to which they are adapted.

RAPID GASOLINE WAGON IN THE SERVICE OF A DAIRY.

EUROPE NOW UNANIMOUS ON RACE RULES.

OSTEND, BELGIUM, July 22.—Europe's important automobile races will next year be run under uniform rules adopted by the delegates of the international conference representing the automobile clubs of France, Germany, England, Italy, Austria, Holland, Belgium and Spain. The maximum bore for four-cylinder engines has been fixed at 155 millimeters (6.1 inches) and the minimum weight is 1,100 kilograms (2,425 pounds). In all other respects constructors are given entire liberty.

Four suggestions came before the conference: Limited cylinder area with minimum weight; limited bore with minimum weight; limited fuel consumption, and complete liberty in size and weight of engine and chassis. Germany spoke in favor of a maximum bore of 135 millimeters for four-cylinder engines, Italy asked that all regulations be abolished, makers being allowed to build what they considered the fastest machine unfettered by weight and cylinder limitations, while France asked for a maximum bore of 160 millimeters with weight limit fixed at 2,425 pounds. In abandoning the conditions governing the Grand Prix, the French delegates declared that they were thoroughly satisfied with the results obtained, but did not intend to repeat the experiment, owing to the difficulty of carrying out the rules. Under a limited fuel regulation there is always a possibility of fraud, of a good machine being eliminated by the breaking of a fuel pipe, and of the accidental breakage of the seals calling forth protests; in addition, the variations of weather make it difficult to fix upon a supply of fuel which will be universally acceptable. Their proposal for next year was 6.2 inches bore and 2,425 pounds maximum weight. After a short discussion a compromise was made between the French and German resolution, all the European clubs agreeing to run their races on the basis of 6.1 inches maximum bore and 2,425 pounds maximum car weight. Nothing was discussed regarding six and eight-cylinder engines, or those of the Gobron type.

As the result of this unanimity, automobile racing in Europe next year is likely to be much more successful than in the past two or three years. Builders will not be under the necessity of constructing several types of machines, one set now being available for the Grand Prix, the Ardennes, Targa Florio, Brescia circuit and whatever race Germany decides to organize. America was not represented at the conference, but if it is desired to obtain European entries for the 1908 Vanderbilt race the rules will have to be those of the Ostend conference, or be so framed as to admit machines built under these new conditions.

ESPLANADE FOR PARIS AUTOMOBILE SALON.

PARIS, July 23.—A further generous concession to the Automobile Club of France has been made by the city municipality in the granting of the Esplanade des Invalides for the industrial section annex of the Salon. Last year a portion of this magnificent open space was granted to the promoters of the Salon, practically free of cost, but with the reservation that the main entrance should be kept about three hundred yards from the riverside. For this year's decennial show an area of 36,000 square yards, which is about equal to the total floor area of the Grand Palais, has been granted, on which will be built a steel frame structure. The main entrance to the industrial section will be at the extremity of the Alexandre III bridge spanning the river Seine, and only distant from the Grand Palais 160 yards. It is intended to make the external decorative effect more brilliant than ever by the erection of a monumental entrance to the annex and to connect the two buildings by a luminous triumphal arch.

Further developing his retrospective exhibition as a part of the next Paris Salon, General Manager Gustave Rives announces that there will be an exhibition of documents and objects connected with the work of some of the pioneer automobilists, among others of Daimler, Levassor, Serpollet, Forest, Lenoir, and Chasseloup-Laubat. Requests for exhibition space in the show close on August 15, the Salon opening on November 12 and closing its doors on December 1.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Oct. 24-31.....—New York City, Grand Central Palace, Eighth Annual Automobile Show, Automobile Club of America and the American Motor Car Manufacturers' Association.

Oct. 31-Nov. 7..—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.

Nov. 30-Dec. 7..—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show, and First Annual Commercial Vehicle Show, National Association of Automobile Manufacturers.

Dec. 28-Jan. 4..—New York City, Madison Square Garden, Importers' Salon. C. R. Mabley, secretary and manager.

April 6-11.....—Buffalo, Convention Hall, Motor Boat and Sportsman's Show. D. H. Lewis, manager.

Races, Hill-Climbs, Etc.

Aug. 3.....—New York City, Fort George Hill Climb.

Aug. 9.....—Algonquin, Ill., Hill Climb, Chicago Motor Club and Chicago Automobile Trade Association.

Aug. 5-10.....—Atlantic City, N. J., Automobile Carnival, Atlantic City Automobile Club.

Aug. 9-10.....—New York City, Brighton Beach Track, 24-hour Automobile Race, United States Motor Racing Association.

Aug. 17.....—Newark, N. J., Olympic Park, Carnival of the New Jersey Automobile and Motor Club.

Sept. 2.....—Chicago, Harlem Track, Race Meet under the auspices of the Chicago Automobile Club.

Sept. 2.....—Bridgeport, Conn., Labor Day Hill Climb, Sport Hill, Bridgeport Automobile Club.

Sept. 5.....—Chicago, Cedar Lake Economy Run, Chicago Motor Club and Chicago Automobile Trade Ass'n.

Sept. 7.....—Hartford, Conn., Hill Climb, under the auspices of the Automobile Club of Hartford.

Sept. 14.....—Hartford, Conn., Charter Oak Park, Gymkhana Games. Automobile club of Hartford.

Sept. 14.....—Albany, N. Y., 95-Mile Road Race, under the auspices of the Albany Automobile Club.

Oct. 21.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize, Aero Club of America.

Motor Boat Races.

Aug. 13-15.....—Chippewa Bay, St. Lawrence River, Gold Challenge Cup Race, American Power Boat Ass'n.

Aug. 22.....—New York to Jamestown (Va.), Annual Cruise, American Power Boat Association.

Sept. 2-6.....—Jamestown (Va.) Exposition Motor Boat Races.

FOREIGN.

Shows.

Sept. 28-Oct. 7..—Denmark, Copenhagen International Automobile Show.

Nov. 11-23.....—London, Olympia Motor Show.
Grand Palais, Esplanade des Invalides, Automobile Club of France. Applications for space close August 15.

Nov. 12-Dec. 1..—Paris, Exposition Decennale de l'Automobile,

Races, Hill-Climbs, Etc.

July 31-Aug. 8..—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.

Aug. 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile Race for the Press Cup, A. C. of France.

Aug. 3.....—Isle of Wight, British International Cup, Motor Boat Race.

Aug. 23.....—Belgium, Ostend Motor Boat Meeting.

Aug. 11-29.....—France, Coupe de Auvergne.

Sept. 1-2.....—Italy, Brescia Circuit, Florio Cup. A. C. of Italy.

Sept. 15.....—Austria, Semmering Hill Climb, Austrian Automobile Club.

Sept. 15.....—France, Chateau-Thierry Hill Climb.

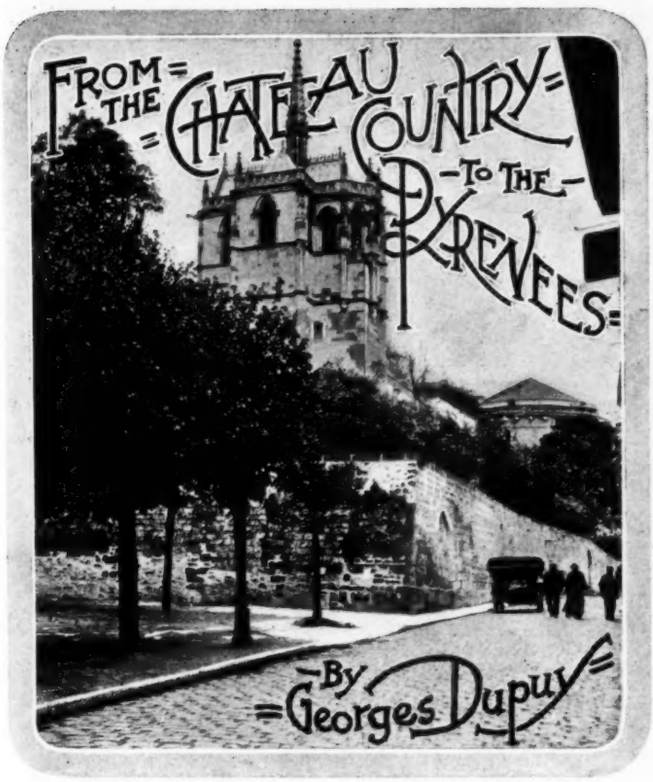
Oct. 1-15.....—Paris, Electric Vehicle Competition, Automobile Club of France.

Oct. 20.....—France, Gaillon Hill Climb.

Nov. 1-15.....—France, Voiturette Contest near Paris.

May 16, 1908....—Sicily, Targa Florio, Automobile Club of Italy.

July 14, 1908....—Paris to London, Aerial Race.



AMBOISE, AN ARCHITECTURAL JEWEL OF FAIR TOURAINE.

SUNDAY, May the Seventh.—The vibration of four long, slow, musing strokes spread themselves over Amboise, still asleep in the imprecise white of dawn. Right at the foot of the *donjon* that shelters the old bell stands our blue Stearns, rested, watered, lubricated, hardly smoking, and roaring discreetly in the great silence. Clarence, my mechanician, his head under the bonnet, listens attentively to the rhythm of the pistons.

The motor of an automobile—and particularly that of a Yankee-made automobile—is (as a good many autoists of nowadays know, I presume) an enamored faun, who vowed to sing an eternal, monotonous banjo tune on one note, "raw-raw-raw-raw," for the only love of eight slender, coquettish little valves dancing a perpetual and synchronous little jig, "tekatekatekatac." But what is the good of trying to explain those abstract things to Clarence? That fellow positively believes in nothing. On such a mysterious revelation I am sure he would spit his "Virginia leaf" on the running board and reply in a sort of a disgusted way, "Watchertawkin' about?"

* * *

In the wind, one hand on the wheel, Clarence buttons his covercoat up to the collar, for the air is really cold. Light gray vapors softly ascend from the brown fields and the green prairies. The road is wide, smooth, even, and we hear the fine gravel of the macadam creak under the tires. Over yonder, at the extreme limit of the horizon, a symphony of glorious reds announce the accession of the sun. We maintain a regular gait of thirty-five miles. I wish we could dine at Bordeaux by seven to-night and reach Mont-de-Marsan with the head lights.

* * *

7:30 A.M., Chatellerault.—We just had breakfast here. Old farmers, scared dogs and a few astonished cows, in the little villages of Montbazon, Sorigny, Sainte Maure, La Celle St. Avant, Port de Pile, have seen "Miss Stearns No. 270" pass in a flash, followed by a cloud of dust, buzzing and impeccable, with her two enormous glassed eyes, and driven by a nonchalant little fellow smoking a briar pipe. They have seen Miss "No. 270" climb the hill and disappear in the perspective. Then the farmers have sighed and crossed the road, the dogs have barked, the cows have resumed their ruminating. I am writing these hasty notes while Clarence, swearing like a trooper (when in English, they don't mind so much in France), searches the whole car for a handful of waste. I know there is none, as I used the last last night to wipe the mud off my shoes.

* * *

9:00 A.M.—Here is Poitiers. I can see the top of its four pointy steeples emerging from behind the long hill. We climb smoothly and keeping the same gait, with a little touch of the accelerator, and on high speed, of course.

"Saw that?" cries Clarence, placing his hand in front of his mouth to let me hear behind.

I turn quick to see the road. In the whirlwind of dust a good dozen white feathers are dancing a vague two-step.

The pavement in Poitiers must be three centuries old. The Louis XI. Cathedral is a piece of embroidery in itself. Here is the Place d'Armes and the statue of "Le Roi Soleil." "Now, what does that gendarme want?—What?—Clarence, please stop awhile.—What?—Our bridge ticket?—No, we did not take any ticket before crossing the bridge.—Why don't you put a sign there, or something, to let automobilists know they have to stop?—How much is it?—Three sous?—Here you are.—Don't mention it."

* * *

We are again on the wide, smooth road, bordered with high and pensive poplars, agitated by the morning breeze. Far away, on the gray ribbon, at the end of the perspective, a solitary little black point has just appeared. It is a man, a man with a pack on his back. It is a "chemineau," I can see it the way he walks on the grassy side of the road. The "chemineau" is a typical wanderer, an honest tramp of France, who perpetually migrates from one town to another in order to improve his talents. The "chemineau" is usually a carpenter, a blacksmith, or a roofmaker. He is also a dreamer, loving the deserted road, the kilometer stones and the warm sun. "Clarence, old man, let's stop to pick up this fellow; he looks tired." (Clarence always growls on such occasions, but what's the use of paying any attention to his feelings?)

Hello! Mon vieux, où allez vous?" (where are you going?).

"To Bordeaux, my brave friend, by way of Angoulême and Libourne, about 220 kilometers; yes, my brave friend. Sun is hot, my brave friend, but I hope I'll be there by Wednesday at noontime."

He is a short old fellow, tanned and gray, and what he wears on his feet are anything but shoes. But that is very kind of him, just the same, to call me "his brave friend."

"Get in quick! We will put you at Bordeaux to-night. Well, hurry up!"

"Do you really mean——?"

The poor man is crazy with surprise and joy. All trembling, he puts his load on the floor of the large tonneau and while the car, having resumed its gait, devours the road again, I help him to insert his arms into the sleeves of a long raincoat, which wraps him entirely. Then he sits on the soft cushions and smiles in the wind.

"Are you comfortable?"

"This is heaven, my brave friend; this is heaven."

"Very well then."

* * *

The wide valley of the Charente river is even more charming than the paintings of Varennes. On the limitless green carpet live little hamlets, little streams, little hills, little cattle, and a narrow-gauged railroad invaded by all kinds of herbs and wild flowers runs alongside the highway.

An impressionistic sketch from advance pages of M. Dupuy's book, "A 6,000 Mile Trip Around Europe in an American Made Car."

"Yes, my brave friend, this is the happiest day of my life." (KONG-KONG-KONG, plays Clarence on the horn.) "Yes, indeed, and let me introduce myself. My name is Lagrave, Charles Lagrave, born at Pau in 1865, wood-sawer by trade, but since I had (KONG-KONG-KONG) an accident at my left leg (the chemineaus all have something at their legs, that is the reason why they perpetually tramp all over the country), a bad accident, my brave friend, getting down a staircase, I sprained my ankle, and (KONG-KONG-KONG) I am sometimes obliged to——"

"Get out of there, you crazy old witch!" That is Clarence singing this time. The old woman wakes up, utters an awful cry, and the donkey, in a sort of a funny little cake-walk, goes right to the ditch. That doesn't make any difference. The old woman, you have understood, was sound asleep in her cart in the very middle of the way.

* * *

12:45, Ruffec.—That lunch was excellent. Charles Lagrave, my brave friend, always wrapped in the raincoat (because his clothes are so ragged) has enjoyed it too. But despite all his exquisite French politeness I do not think he will ever make friends with Clarence. Clarence looks at him as he would at a nigger. But what do we care, Charles and I?

* * *

2:00 P.M.—Fifty-eight miles, with a good dozen long, steep hills, in one hour and thirty-five minutes. That is not bad. Charles is still smoking the cigar I offered him at Ruffec and he smokes some of his own moustache also. That man certainly does look funny with a pair of goggles and a skating cap!

* * *

3:45 P.M.—Like happy nations, we have no history. Miss Stearns No. 270, roaring imperceptibly, swallows every hill, Clarence says nothing, Charles sleeps, I write these lines with a good-willing pencil, and the trees, the telegraph poles, the villages, the railroad crossings, the little cantonnier huts on each side of the road fly back in the wind.

* * *

5:00 P.M.—Here is Libourne. We stop at the entrance of the town to "oil up." While Clarence opens his drop-oiler I get off to pump a soft tire at the rear. An old gentleman approaches, looks at the dusty machine, looks at the dirty workers at both ends of it, and finally addresses Charles, who is gravely studying the map in his corner. The old gentleman must be the Notary Public or perhaps the School Master. He has the accent of Gascony.

"Bonjour, monsieur! That is a very powerful automobile, is it not?"

"Yes," says Charles.

"How many 'chevaux' (horse or horsepower), if you please?"

"Oh," replies Charles, anxious to put an end to the conversation, "don't you worry about the chevaux; we've got enough; yes, my brave friend, we've got enough, I tell you that!"

* * *

8:20 P.M.—We have left Bordeaux more than an hour ago. We must not be far from Castel-Jaloux. I don't think it would be reasonable to try to make Mont-de-Marsan to-night. Three hundred and seven miles have been covered to-day up to this minute, as I can see by the speedometer.

We are in the great forest of the Landes, where Victor Hugo says he met the Devil and his companions. The sweet, fragrant odor of the pines surrounds us. The sun has sunk behind the mournful trees.

My brave friend Charles we left in Bordeaux at the corner of the Rue Ste. Catherine. Poor Charles!

Now the soft night comes down. A plucky little hare crosses the road once in awhile, and over there, at five hundred yards, shines the ancient lamp post of the Hotel de la Boule d'Argent, first house in Castel-Jaloux, on the right, when you come from Bordeaux.

"Good evening, Madame."

"Good evening, Messieurs."

"We are very, very hungry."

OLYMPIC GAMES TO INCLUDE MOTOR EVENTS.

LONDON, July 22.—Automobile events in connection with the international Olympic games to be held in London next year will consist of three races on the Brooklands track at Weybridge, the course at the Stadium not being suited for motor racing. The events will be a flying kilometer for racing machines; a 9-mile race for touring cars of not more than 30 horsepower and carrying 280 pounds weight in addition to the driver and mechanic; a 14-mile race for racing machines not exceeding 2,600 pounds in weight, including driver and mechanic. These events, as well as a motor boat race on Southampton water, will be held in July.

ACROSS THE LEVEL STRETCHES OF THE LANDES, WE REVELED IN FRANCE'S MAGNIFICENT HIGHWAYS.

STATE HIGHWAY AT SPENCER, MASS., PAVED WITH HASSAM CONCRETE.

THAT DUSTLESS ROAD IN OLD BAY STATE.

WORCESTER, MASS., July 29.—One section of the main through route for automobiles between New York and Boston, over which motor travel is now rushing, gives up no dust for the wayfarer, no matter what the condition of the rest of the highways, even in Massachusetts, the home of the State highway. This is in the town of Spencer, just west of the center of the town, and reached by the east-bound autoist after passing East Brookfield, thirty-six miles east of Springfield. It was built under orders issued by the Massachusetts State Highway Commissioners in 1906.

The paving is known as the Hassam paving, for the inventor of this method of laying concrete paving is Walter E. Hassam, former street commissioner of Worcester and now general manager of the Hassam Paving Company. He has laid many thousand yards of paving in the past year all over the country. One of the showpoints for his paving is at Phoebus, Va., where the Jamestown Exposition visitors can see it. Another section is being laid at Niagara Falls, N. Y., and he will have it in Boston, New York and many other large cities before the season is over.

The surface is smooth, but there is sufficient grittiness to the top of the highway to prevent slipping or skidding, and one of the fastest miles on the New York-Boston run is invariably done on this section of State highway at Spencer.

In the illustration Vice-president Daniel F. Gay of the Worcester Automobile Club is shown traveling at a rate of forty miles an hour on a very dusty day—at least it was dusty on other places found that afternoon.

The concrete roadway stood the weather of last winter in good shape and looks to be good for a long time without perceptible wear.

This section of highway was looked over carefully, together with another section of the same highway built by the Hassam Company at Williamstown, Mass., by A. R. Pardington when he was looking up data for the Long Island parkway.

MAKING A DUSTLESS STREET.

BOSTON, July 29.—Commonwealth avenue in Boston is one of the splendid boulevards of the famous Back Bay district, a broad, handsome street, parked through the center and lined with fine residences, forming the main pleasure thoroughfare out of the city to Brookline and the Newtons. For many years it has been a favorite thoroughfare for automobiles.

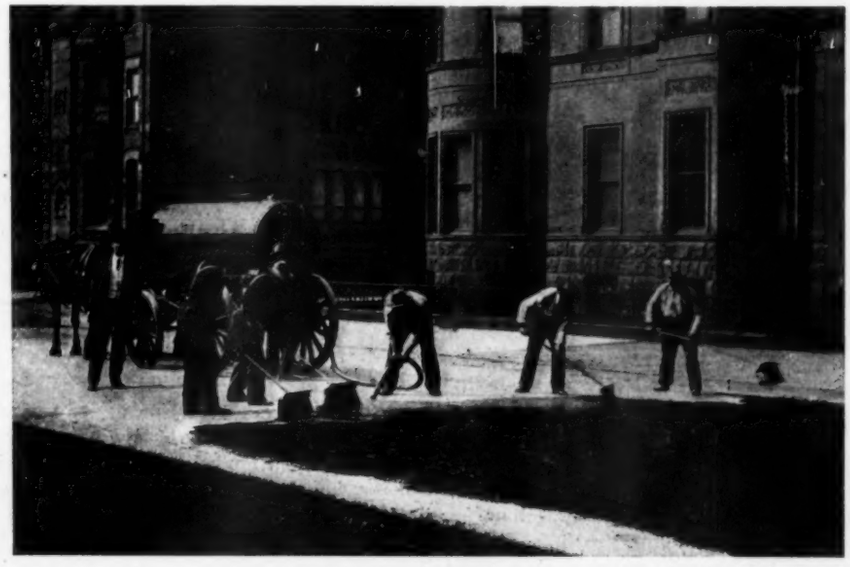
As it was intended only for light vehicle traffic, and not for business uses, the avenue was macadamized and the result since the advent of the automobile has been a vexatious road problem, which led many of the residents to think that asphalt or wood pavement could not be avoided. The Metropolitan Park Commission and the city of Newton, however, have solved the problem satisfactorily without going to much expense, and the Back Bay residents will still have their quiet, easy riding, macadam pavement without the constant rebuilding and the dust.

The road was first carefully swept, to remove surplus dirt and loose particles, and the tarvia was then applied hot through a hose and rubbed into the road with street-sweepers' brooms. After it had permeated the road and cooled for a period of about five hours, a light coat of screenings was spread and a steam roller completed the treatment, leaving a smooth, compact surface.

One of the peculiar features of macadam treated this way has been noticeable after a few months, namely, that up to a certain point a tarviated road improves, instead of deteriorating, with use. Uneven spots wear smooth instead of tearing loose or raveling, and high spots in the road wear down to their proper level.

Following the melting of the snow after its first winter, the tarviated part of Commonwealth avenue (opposite the Hotel Vendome) was found to be the only section in Boston which did not need to be resurfaced, while in Newton the road in front of the Brae Burn Club was as smooth as a billiard table. The adjacent roads will require a large expenditure to put them in good condition for the season.

The process is a development of French road practice. In France for a number of years certain grades of tar have been very generally used for highway improvement, and the French road engineers, who are undoubtedly the best in the world, have developed the method of application and have even invented elaborate machinery for applying their tar treatment. In this country about a million yards of roadways have been treated with this material for the prevention of dust with great success.



SPREADING TARVIA ON COMMONWEALH AVENUE, BOSTON.

THE AUTOMOBILE

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"	This Issue	16,500
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Some Mechanical Lessons from the A. A. A. Tour. Doubtless the fact that by far the most common form of mechanical trouble encountered by the competitors in the recent A. A. A. tour for the Glidden and Hower trophies had to do with the axles and suspension of the cars, will be seized upon for criticism and the American car put down as weak in these very important respects. Had the route of the tour been over the park-like roads of France or England, or even over such going as was selected for the recent A. C. A. sealed bonnet contest, for instance, there would be considerable foundation of truth in the charge, but no one who participated in the 1,600-mile struggle, whether technically trained or otherwise, could justly accuse such cars as went down before the onslaught as being weak in this, or, in fact, in other respects. True, not a few of them came through wholly unscathed. The more credit to them. It only goes to show that while American cars as a whole are remarkably trustworthy and enduring there are still some that are better than others, and doubtless there always will be.

There might be some justice in the charge also had the failures of the parts in question been wholly due to the wear and tear occasioned by legitimate touring service. To put it mildly, there was compressed into the fortnight of the tour the ample equivalent of more than a season of the hardest kind of touring, for no private owner would voluntarily subject his machine to such gruelling as the drivers in the tour found themselves compelled to in order to attempt to fulfill its arduous conditions. And to make the charge totally baseless there is the fact that almost without exception these failures were the result of accidents pure and simple. There is little to be wondered at in the breaking of springs or axles when a car is hurtled into a ditch at high speed—rather the marvel is that those which met this fate, and they were not a few, did not suffer more grievous damage. Without doubt the most striking mechanical lesson of the tour brought out is the wonderfully high factor of engine reliability displayed by such a number of cars under the worst possible conditions. The percentage of trouble traceable solely to the motor or its accessories was practically a negligible quantity. There is still room for improvement in the automobile, whether American or otherwise, but the lesson of the tour is not half so much that a better car is needed as that better roads are a crying necessity.

What Is to Be Looked for in the 1908 American Car. Experience in the past few years has demonstrated that the American automobile industry, as a whole, has entered upon a distinctive period in its career so far as the present and future character of its product is concerned. Up to 1904, or probably as late as 1905, it was customary to regard the coming of each year as an opportunity to give full sway to the designer's theorizing by bringing forth something that should be as different as possible from the model that had preceded it. The result naturally was that cars of the same make but of different years' models bore no resemblance to one another, either in outside appearance or constructional features. The work of the year was literally "dumped overboard" and a fresh start made at the last moment—the new model frequently not being out of the shop in time to reach the annual show at its opening.

There are doubtless those who think that similar conditions still prevail to a greater or less extent in the industry to-day, but nothing could be further from the reality. It may be a disputed point whether 1904 or 1905 really saw the passing of this pernicious state of unsettledness, but that it did finally pass for good about that time there can be no possible question. All of which means there will be no *new* cars for 1908, in the sense in which the word was construed up to the years in question. There will be new models galore—each maker will have one or several—but they will one and all embody what experience has taught their makers is sound from an engineering point of view, together with what detailed refinement that same experience has shown can be added to make the car a closer approach to that goal of perfection in simplicity and reliability for which all are striving.

Good Results Certain from Uniform Race Rules. When the delegates of all the national automobile clubs of Europe united at Ostend and unanimously decided upon a mechanical formula to govern future speed tests, they laid the way for an important development of the industry. Despite the hoarse ravings of a certain section of the public and a very small number of those within the fold against the continuance of racing, European constructors are convinced that speed, and speed alone, can improve the breed of automobiles. By speed is of course meant the holding of serious tests, with every possible guarantee for participants and public, and not the wild scamperings of irresponsible individuals after self-controlled records. Under the new conditions fixing cylinder bore at 6.1 inches and weight limit at 2,425 pounds, constructors need build only one set of racing machines with which they may figure in at least half a dozen international events. Compared with this year's system, calling for at least three different types of cars, the economy from a manufacturing point of view is enormous.

An interesting question raised by the new racing rules is will next year's machines, with their bore reduced one inch, be able to maintain this year's record? Constructors themselves are divided; but it is safe to predict that the diminution, if any, will not be in proportion to the reduction of cylinder area, and that the whole range of automobiles will profit by the year's experiments.

NO VANDERBILT CUP RACE TO BE HELD THIS YEAR

THERE will be no Vanderbilt Cup race this year. This decision and the reasons for it are announced in the following notice, issued on Saturday last from the A. A. A. headquarters, 437 Fifth avenue, New York City:

There will be no contest for the William K. Vanderbilt Jr. Cup during the year 1907, at least, in the United States. This announcement, reluctantly made by the Commission, follows an attempt to promote the race covering several months. The unfavorable attitude of the Governor of the State of New York with regard to the proposed use of the militia to guard the course; the failure of the New Jersey State Senate to convene in special session owing to deadlock; the great distance which the foreigners would be obliged to travel in the event of accepting the very cordial invitation of the Governor of California, and the lack of assurance from Missouri, due to the absence of Governor Folk from the State, that the guard of the State could be used, makes necessary the announcement.

The donor of the cup, William K. Vanderbilt, Jr., and the Chairman of the Commission, Jefferson DeMont Thompson, have been in correspondence with the acting chairman by cable, and it has been deemed wise, in view of the delays and the foregoing conditions, to defer the holding of the race in this country this year.

(Signed) A. R. PARDINGTON, Acting Chairman,
F. H. ELLIOTT, Secretary,
William K. Vanderbilt, Jr., Cup Commission.

New York, July 27, 1907.

While the giving up of the race for this year is a great disappointment to the manufacturers of high speed cars, the members of the Vanderbilt Cup Commission, including the donor of the cup, did not care to go ahead with a race which would have to be run under the perilous conditions which reached a culminating point in the running of the 1906 event on Long Island. Unable to secure militia to guard the course, none of the active members of the commission cared to undergo again the strain to which they have been subjected for the past three years. The policing of the 1904 course was less difficult because of the comparatively small attendance, though Chairman Pardington and Cup Donor Vanderbilt experienced great relief when the day ended without any accident. At the conclusion of the 1905 race, Chairman Morrell expressed the opinion that there would never be another cup race on Long Island. The 1906 A. A. A. Racing Board voted to hold another event, but when it concluded with one fatality and another serious accident, a quick decision was reached that unless the 1907 race could be held on the Long Island Motor Parkway, or with militia to guard the road, if the parkway were not completed in time, its running would have to be given up. Chairman Thompson, Acting Chairman Pardington, President Hotchkiss, and other A. A. A. officials have used their utmost endeavors to secure a militia guarded course, but their efforts have been futile, and those inclined at all to be fair-minded recognize the conscientious efforts which have been made to comply with the desires of the manufacturers.

Though it has been suggested by two automobile editors of New York dailies that the A. C. A. should now hold an open road race of an international character, it is a certainty that nothing of the kind will be attempted, the club's officers still having in mind the unfortunate Staten Island experience of several years ago.

Despite statements printed to the contrary, the American makers have not gone to any great expense in preparation for a cup race. One firm has reconstructed its 1906 cup cars and now will utilize them in other ways. Another firm intended to use its 1906 car almost as it stands; a third company had in mind the using of its stock chassis with racing body; and others had made but slight progress in the construction of speed cars.

It is among the probabilities that there may be held in Florida next winter a long-distance event for racing cars and also a somewhat similar race of a stock car chassis character. Since the announcement that the Vanderbilt Cup race would not be held, there has been a consequent revival in talk of Florida and its winter program. It is known that the Florida East Coast Automobile Association has asked the A. A. A. Racing Board to take charge of the meet.

HOW ONE NEW JERSEY AUTOIST REGARDS ROAD RACING

Editor THE AUTOMOBILE:

In your issue of July 25 appears an editorial entitled "New Jersey Repudiates the Vanderbilt Race." In holding us up to ridicule because we do not see fit to allow the race I feel that you do us an injustice, and the tone of the article, in which you call us "foreigners," and accuse us of mediæval ideas, is undignified and petulant.

As a matter both of public policy and of the true interests of the automobile it is unwise for any State to grant the use of its roads for a race. Its greatest harm is the fostering of a mania for speed which is the cause of most of the prejudice against us and of most of the restrictive laws from which we suffer.

In the community in which I live we have over a dozen automobilists. All of us use the roads with care and with due consideration for the rights of others, and by so doing have almost entirely overcome the prejudice here against the automobile. Every once in a while, however, some reckless driver of a high-powered machine rushes through our midst, tearing up our good roads and scatters them in the form of dust over our farms and lawns, driving horses into the ditches, and frightening women and children; and immediately we hear the cry that we should be placed under more severe restrictions.

The consequences of this reckless craze for speed are sometimes frightful. Witness the accident recently down near Barnegat, in which a car running at racing speed crashed into a family touring party, killing one and dangerously injuring several others. An occurrence of this sort is a brutal outrage which words are not strong enough to condemn. It is a direct consequence of the racing spirit, and its perpetrators should be punished by imprisonment for manslaughter.

Every one who feels enthusiastic over the present development of the automobile, and who looks forward to its future usefulness to all classes of society for business and for healthful recreation, should do all in his power to discourage racing, and I believe the policy of your otherwise excellent paper in favoring it is suicidal.

In refusing to permit the Vanderbilt Cup race to be held here our State is upholding the right of all users of the roads, in furthering the true interests of the automobile, and is giving a splendid example of our far-famed "Jersey justice."

Moorestown, N. J. JOSEPH STOKES.

PANHARD BOAT WINS PARIS-TO-SEA RACE.

TROUVILLE, FRANCE, July 25.—The *Panhard Tellier*, victorious all along the line at Monaco, has proved herself the victor in the Paris-to-the-Sea race, just concluded here. Her time is two minutes faster than the previous record. *La Rapière II*, also with Panhard engines, came second, followed by the *Mercedes*. In the cruiser class *La Lorraine* was first, with *New Trefle* (Brasier engine) second, and *Nautilus Mutel* (Mutel motor) third. The race, which was a seven-day event, united twenty-five competitors, twenty of which were present at the finish.

CAN THE GRAND PRIX RECORD BE BROKEN?

PARIS, July 23.—A bet of more than local interest has been made between Louis Renault and Rene de Knyff, director of the Panhard firm, on the possible speed of next year's racers. With cylinder bore reduced to 155 millimeters one party maintains that speed will be reduced, the other claims that the Dieppe record will be maintained. This year, Fiat, Darracq and Dietrich had 180 mm. bore, Renault and Brasier, 165. To maintain the Grand Prix record will therefore require a considerable increase of efficiency in the engine and transmission.

AUTOMOBILE RACING IN THE NORTHWEST.

WINNIPEG, MAN., July 26.—With the exception of what might have proved a bad accident to Bruno Seibel, better known as the "Flying Dutchman," in the handicap race, the meet held under the auspices of the Winnipeg Automobile Club on Saturday last was a great success. Fully 7,000 people turned out to see the races, and the whole affair was run off without a hitch, due to the excellent management of the promoters. The program of eight events was well varied, and provided constant interest for the spectators. It led off with a two-mile event for Ford runabouts, which was won by F. Lion, driving for J. Maw & Company, in 3:56. This was followed by an event at the same distance for fully equipped touring cars, in which a Stevens-Duryea 20, a six-cylinder Ford and two Oldsmobiles, one of them a roadster, lined up for the start. W. Fisher, driving the roadster, came in first in 3:52, with L. Grussey, in the Stevens-Duryea, tagging on to his rear wheel, a close second.

The track is a half-mile oval with a cinder surface, and this seemed to worry Seibel, who was down for a two-mile exhibition in the Peerless *Red Devil*, so that the best he could do was 2:56. The next number on the program was a purely amateur event, dubbed a novelty race at three miles, making the first lap empty, then pick up three passengers, discharging them again at the end of the second lap, re-embarking them at the third and again losing them at the fourth, making the last two laps empty. The passengers were the most enthusiastic competitors of the lot, and in their haste to get off and not delay the car in which they were riding they usually started long before it came to a stop, with the result that the track was covered with involuntary acrobats for some time. D. E. Gourlay in a four-cylinder Oldsmobile was an easy winner, followed by Dan Woods in a second car of the same make. Time 6.18 1-2. Then Oldfield did a two-mile exhibition stunt in 2:38, which was 10 3-5 seconds better than existing Canadian track records. This was followed by a three-mile handicap event, on the fourth lap of which Seibel went through the fence on one of the turns, Fisher in the Olds roadster only saving himself from a collision by some quick and cool work with the wheel, which also saved him the race, the six-cylinder Ford, driven by McGregor, taking second. Time 5:28 1-2.

A 25-mile match race for $100 a side between a Ford and a Maxwell runabout closed the program, and proved one of the most exciting events of the day, as the issue was in doubt right to the last. F. Lion, driving the Ford, finally won by almost a lap in 48:12 4-5, his competitor being L. Grussey, who drove for the Dominion Automobile Company.

ATLANTIC CITY'S AUTOMOBILE CARNIVAL.

ATLANTIC CITY, N. J., July 30.—This up-to-date city by the sea will be turned over to the automobilists next week, and if preparations count for anything there will be a busy innings for all kinds of autoists. The speed contingent will open the carnival with two days of racing on Ventnor Beach, and the entry list will contain such good ones as Thomas, Darracq, Locomobile, De Dietrich, and Matheson, Vanderbilt Cup racers, Christie and his "Blue Streak," and several other of the fast brigade. The racing part of the carnival is in charge of the Atlantic City Automobile Club, with Harry Cook, chairman of its racing committee, the man at the helm, which means that there will be nothing lacking in the way of arrangements. The motorcyclists will have races for their kind.

The floral parade will take place Wednesday and cups innumerable are offered for the best decorated cars. Pacific avenue, seven miles long, will be the route of the parade, with the reviewing stand at City Park, between the Marlborough-Blenheim and Brighton hotels.

Concluding the week will be the three-day exhibit of cars on Young's' "million dollar pier," which will supply an ideal location for this feature of the carnival. C. Wood Tatham is the president of the well-planned auto week.

HARRISBURG COMPETITORS TAKE HONORS.

READING, PA., July 29.—It was Harrisburg day Friday on the Fair Ground track at the meet held under the auspices of the Reading Automobile Racing Association, as entrants from the latter city walked off with practically all the prizes. The meet opened with a big parade and carnival in the morning and despite threatening weather and a light sprinkle that looked as if it might turn into a downpour, between two and three thousand people filled the grandstand and overflowed into the bleachers.

The first event on the program was an obstacle race of the now familiar type, in which John E. Sellers, driving a Maxwell, took the prize in 45 seconds by a masterly exhibition of driving, not another one of the competitors succeeding in getting by all the dummies without knocking them over. This was followed by a motorcycle race in two heats, both of which, as well as the final, went to local riders. There was not much excitement provided until the fourth event, which was a two-mile dash for stock gasoline touring cars, the first heat of which was won by a Jackson driven by Chester B. Smith. The final was between the latter and a Ford, Smith bringing the Jackson in first by a liberal margin in 3:11½, the next to the fastest time of the day.

In event No. 5, a stripped Pullman with Robert Martin at the wheel, was victorious over an Acme handled by Edward Lengel. In the second heat the Pullman was steered by J. A. Kline, while his competitor was J. Seager in a Wayne. The race proved close and exciting until the Wayne had motor trouble and had to quit, so that there was no final, to make up for which Kline drove an exhibition mile in 1:33½. These races were followed by what some wag in the crowd dubbed "gin rickey" stunts (gymkhana), much to the amusement of the spectators, and they were in turn followed by the other speed numbers on the program, event No. 7 for gasoline runabouts being captured by Pullmans in both heats. The meet closed with the contest for the Reading *Eagle* silver cup, which was taken by an Acme, but because of a protest no winner was announced. Challenge races will be held August 10, the outcome of several challenges made at the meet.

HILL-CLIMB UNDER NOVEL CONDITIONS.

Not the least interesting feature connected with the annual hill-climb to be held by the Chicago Motor Club, at Algonquin, Ill., on August 9, is the method of classifying the competing cars according to their piston area, as adopted by the English club recently. The event is, moreover, in the nature of a twin trial, as the morning session will be devoted to tests made from a standing start, while in the afternoon all attempts at records will be from a flying start. Six classes are provided for; one a free-for-all in the full sense of that term, the others being divided as follows: Class 1, cars with a piston area under 35 square inches; class 2, 35 to 50 square inches; class 3, 50 to 65; class 4, 65 to 90; class 5, over 90 square inches.

The formula upon which the rating is based consists of squaring the bore of one of the cylinders and multiplying by the number of the latter. The adoption of this classification brings about some odd groupings in the cars to line up for the various trials, and it is thought that when the definite results are made known it will be found that this is a thorough test of their ability in hill-climbing. The handicapping system is the same as that used last year, the cylinder dimensions being multiplied by the combined times up the two hills and divided by the weight of the car with driver. The standing-start trial is to be up a quarter-mile incline, said to be the highest hill in the State, while the flying-start trials will be on a half-mile grade situated on the other side of the town of Algonquin. Last year's record holder is a Pierce-Arrow, which made the distance in :34 flat from a standing start, while in the flying start trials the Pierce and the Stevens-Duryea Six were tried at :46 2-5. The Autocar, Jackson, Queen and Pierce were the class winners. Entries for the event close with Charles P. Root, 1200 Michigan avenue, Chicago, on August 5. The fee is $30, half of which is refunded at start.

GENERAL CLUB NEWS FROM FAR AND NEAR

Enforcement of the Pennsylvania Automobile Law.

PHILADELPHIA, July 29.—S. Boyer Davis, of counsel to the Automobile Club of Philadelphia, and who is also the secretary of the club, has sent out a general letter to the members of that organization regarding the recent epidemic of trapping that has sprung up near the Quaker City and in eastern Pennsylvania generally. His opinion of the spirit in which the law is enforced will doubtless come as a surprise to many. "In the course of my duties I have met many of the local officers and have had opportunity to observe their work and methods of enforcing the automobile law. The majority I have found to be fair and liberal, and in most cases the officers reporting violations were paid by the day and do not benefit by making such reports." While rank injustices are frequently perpetrated in making arrests, there is little doubt that thoughtless, if not deliberate, violation of the law is more or less common, and this Mr. Davis says he has found to be the case, cautioning the members of the club to pay particular attention to compliance with the legal requirements, as otherwise the danger of stringent and restrictive legislation is imminent.

Outing of the New Jersey Automobile and Motor Club.

NEWARK, N. J., July 29.—The next outing of the New Jersey Automobile and Motor Club may be to Olympic Park, August 17, if arrangements can be made in time. Chairman Joseph H. Wood, of the house committee, and Secretary Horace A. Bonnell recently visited Olympic Park to see what the outlook was for holding an event at that place. Some sort of a carnival, slow race on the high gear and other novelty events, a dinner at the Park restaurant, and the opera in the evening may be included in the program. A club run to some coast resort with an old-fashioned shore dinner is a possibility of the near future.

Lancastrians Will Inspect the County Turnpikes.

LANCASTER, PA., July 29.—At a meeting of the board of directors of the Lancaster Automobile Club last Friday evening a letter was read from ex-Attorney-General W. U. Hensel, the club's legal adviser, in reference to the appointment of committees and the work that the club can do. As a result, a committee of inspection will go over all the turnpikes in the county to learn whether the companies are living up to their charter. One man will have a turnpike to inspect and he will go over it and note any breakers or other defects in the pike. The club will then take action against them.

Buffalo Club to Assist Old Home Week Auto Event.

BUFFALO, N. Y., July 29.—Buffalo is to have an Old Home Week in September. One of the features of the week will be a magnificent automobile pageant at night. Every automobilist of the city has been asked to cooperate in making this parade a spectacle long to be remembered by the people. Each car will be expected to be lavishly decorated. Prizes are to be offered. Seymour P. White, president of the Automobile Club, is chairman of the committee that is to arrange the details of the parade. H. A. Meldrum, a director of the club, is assisting him.

Philadelphia Now Has a Ford Motor Club.

PHILADELPHIA, July 29.—Regular organization of the Ford Motor Club of this city has been perfected with the election of Dr. I. E. Bennett as vice-president and R. F. Kohler as secretary and treasurer. The next regular run is scheduled for August 4 to Three Tuns. It is expected thirty cars, ten of which will be driven by ladies, will participate.

Hartford Autoists Arrange Hill Climb and Gymkhana.

HARTFORD, CONN., July 29.—A hill climb on Albany and Prospect avenues on September 7, and a program of gymkhana sports at Charter Oak Park, September 14, will keep interest at a fever heat in the Connecticut Valley during the next six weeks. At a special meeting the Automobile Club of Hartford decided to arrange these events, and for the gymkhana sports has arranged a program of rare attractiveness, teeming with novel features, which will include a parasol race, lamp race, button race, hat race, Teddy Bear race, turning race, and best appearance contest, all to be open to both lady and gentleman drivers. In addition to the above the following track races will be held on the Charter Oak course: Five miles, for cars costing less than $1,500, amateurs to drive (manufacturers and agents barred); five miles, for cars costing $1,500 and less than $3,000, for amateurs, owners to drive; five miles, for cars costing $3,000 or over, for amateurs, owners to drive.

Ohio Valley Auto Club Hands Out Prizes.

WHEELING, W. VA., July 29.—At a meeting held here last week the Ohio Valley Automobile Club awarded a number of trophies to those of its members who have signally distinguished themselves during the past year. The prizes consisted of five handsome loving cups in silver, suitably engraved, which were handed to A. W. Paull, Earl M. Giesy, Charles F. Paxton and two others which will be awarded later, as the members were not present owing to the inclement weather. The club will soon hold a dinner at Colerain, O.

Automobile Club Organized at Winona, Minn.

WINONA, MINN., July 27.—Automobile owners of this city have organized the Automobile Club of Winona, and will have headquarters at the rooms of the Arlington Club for the present, Officers elected for the first year are as follows: President, E. W. Williams; vice-president, H. S. Youmans; secretary and treasurer, Theodore Wold; board of directors, the above-named officers and S. H. Somsen and J. W. S. Gallagher.

CLUB DOINGS IN GENERAL.

MASON CITY, IA.—The first run of the Mason City Automobile Club was held July 22, the trip being to Nora Springs. The club is a new organization and promises to make itself a power in this section of the State.

SAN FRANCISCO.—Fifty women participated in the recent run of the California Women's Automobile Club of this city, to Del Monte early this month. It was the longest and most successful tour ever held by the organization.

WILKES-BARRE, PA.—Direct purchase has been made by the Wilkes-Barre Automobile Club of the mountain boulevard from Albert Lewis, the man who built and owned it. This private road was the easiest route from the valley and has hitherto been closed to autoists, who have been unable to secure permission to use it. The club did the next best thing under the circumstances—purchased it outright.

ROCHESTER, N. Y.—The work of posting the roads in and about Rochester with signboards is well under way, under the direction of the Rochester Automobile Club. Secretary Bert Van Tuyle is making daily trips over the territory, has completed the Scottsville road to Batavia, and has started work on the Churchville road. When this is completed the Geneva and Ridge road will receive his attention.

CONCERNING GEORGIA'S NEW LAW.

ATLANTA, GA., July 29.—Georgia Senators have just applied the brakes to automobiles in passing a bill by Senator Felder, of Macon. The bill fixes the speed limit at fifteen miles an hour and throws other restrictions around the operation of machines. Here are the provisions of the bill briefly stated:

Forbids driving autos in built-up portions of incorporated towns, where houses average less than 150 feet apart, at greater speed than one mile in six minutes.

Forbids greater speed on country highways than one mile in four minutes.

Provides that automobiles cannot be run on any street or highway at greater speed than proper for preservation and safety of public. Act does not in any way affect right of person to sue and recover damages from auto owner.

Lays stringent regulations on auto drivers in regard to persons riding or driving domestic animals.

At a signal from a person riding or driving restive domestic animals, autoists must come to a full stop and remain so until danger is over.

All automobiles must have adequate brakes, good horn or bell, and carry, from one hour after sunset to one hour before sunrise, a white light in front of the car and red light in the rear. The headlight must project light 500 feet ahead of the car.

Act includes automobiles, locomobiles, and all other vehicles propelled otherwise than by muscular power, save electric and steam cars. Violations of act render offenders amenable to section 1039, criminal code.

Act does not affect or abridge right of municipalities to regulate auto driving within limits as they may see proper.

Automobilists are not displaying unusual interest in the bill. They understand that the bill contains a provision that it shall not conflict with the speed laws of any incorporated city or town, and, therefore, will not alter the status as regards speed in Atlanta and other large cities, where most of the automobiles are to be found. They seem to feel that the speed of fifteen miles in the country, provided for in the bill, is all right.

They do have a complaint that the bill is unfair in that it puts the burden on the automobilist to show that he was right in the case of an accident. They say this presupposes that the automobilist is guilty, and he is required to prove his innocence whenever any trouble occurs. Automobile legislation, however, which is new in Georgia, they think will gradually work itself right as the people at large become better acquainted with the subject.

INDIANA HAS GOOD ROADS FEVER.

INDIANAPOLIS, IND., July 30—The crusade for good roads in Indiana, backed not only by automobile men, but by farmers, has reached such large proportions that a number of counties find themselves on the verge of bankruptcy due to extensive road improvements.

At the last session of the Legislature a law was passed making it mandatory for County Commissioners to grant a road of less than three miles in length, connected at each end with an improved free gravel or macadamized road, and providing it is traveled by a rural mail route, upon the petition of fifty persons.

In Randolph County roads that will cost upward of $465,000 have been granted and are under course of construction. There are fifty-four petitions in Putnam County, calling for as many roads. Two of them have been built and paid for. Stone is easily obtained in the county, and fifty are to be built of stone and four of gravel.

There have been forty-five petitions granted in Howard County, and fifteen more are pending. Several others will be petitioned for later. Hamilton County will spend at least $500,000 for roads within the next year, as thirty-six petitions have been granted within three weeks. Adams Township alone is asking for roads that will cost $40,000.

Financial insolvency is threatening Clinton County because of the new law, and it has been discovered that residents of various townships are signing each other's petitions for roads. There will be sixty-three new roads built this year, according to petitions on file, although the number may yet reach 100. The average cost of building the roads is $2,300 a mile. This is a very low figure that is only made possible by the fact that there is an abundance of suitable material right at hand and as yet no difficulty has been experienced in obtaining a sufficient amount of labor at prevailing prices to carry the work of road improvement through—conditions that are not to be found in many other States where stone and gravel are scarce and have to be transported from a distance at a cost which more than doubles the expense of road building.

There are now 148 miles of improved roads in Morgan County, and about sixteen petitions are on file. In Shelby County a road was petitioned for, but the Commissioners were surprised a few days later to receive a remonstrance signed by the same persons presenting the petition.

About fifteen petitions are on file in Madison County. Monroe County will build six new roads, while Wells County Commissioners have sixty-three petitions before them.

The new law provides for a bond issue of 4 per cent. All the land-owners of a county are taxed alike for the improvements.

ROAD SIGNS FROM THE N. Y. STATE PRISON.

As a part of its industrial activity, the Prison Department of the State of New York has taken up the making of road signs, the work being carried on at Dannemora, N. Y., where the Clinton prison is located. The aim has been to produce a signboard that would be proof against the weather at all seasons of the year, and to this end the boards themselves are made of seasoned one-inch white pine, well protected with paint, the letters being painted on in black on a white background and are legible at a distance of 40 to 50 feet, depending on the size of the sign. The painting is thoroughly weatherproof and the signs will last indefinitely. The boards are mounted on wrought-iron standards, heavily coated with white lead as a rust preventative, and to which they are attached by bolts and nuts. They are made in a variety of styles and sizes, such as those shown by the accompanying illustration, depending on the nature of their location, and are sold at nominal prices. The sign shown by the cut is the largest size made and provides 12 different distances, the two parts being at right angles to another, this being variable according to the angle of the crossroads.

A SAMPLE ROAD SIGN.

TEXANS IN A QUANDARY OVER REGISTRATION.

FORT WORTH, TEX., July 27.—When the new Texas law went into effect on the 12th inst., half of the autoists in this city appeared at the Courthouse prepared to pay their 50 cents for registration, but here, as at other places, the county clerks have not yet received copies of the law. Consequently automobilists in this State are all violating the law, because they are unable to comply with it.

E. E. Fosdick, a prominent autoist of this city, has petitioned the commissioners to place a tax of $1 a year on all automobiles and 50 cents a year an all rubber-tired vehicles for the purpose of raising a fund to improve the streets. According to his estimates, the owners of such vehicles expend $50,000 annually for repairs and replacements due to the bad condition of the streets, tires in several instances having been completely cut in two by bottles, while injuries of an almost equally serious nature have become so very common that the expense of tire maintenance—already very high—has become more burdensome than usual.

INTERPRETING CONNECTICUT'S NO SPEED LIMIT LAW

HARTFORD, CONN., July 29.—Instead of being downcast by the taking effect of the new automobile legislation removing the arbitrary speed limit, the rampant advocates of repression are hailing it as a greater opportunity for making large hauls than ever existed under the old law. It seems to be the impression now that they can take up any and every one they see by simply preferring a charge of reckless driving against them. According to Walter S. Schutz, attorney for the Automobile Club of Hartford, the only real change in the speed provision from that in the former law is the insertion of the word "recklessly," and a rate of speed in excess of 25 miles an hour is made *prima facie* evidence that the person operating the vehicle is doing so at a rate of speed greater than is reasonable and proper, and in violation of the provisions of the law.

Section 10 of the old law was to the effect that "no person shall operate a vehicle at a rate of speed greater than is reasonable and proper, having regard to the width, traffic and use of the highway, or so as to endanger property, or the life or limb of any person," and then followed the arbitrary provision that in no event shall the speed exceed 12 miles an hour within city or borough limits or 20 miles an hour without such limits.

If a person is caught driving a car at a rate exceeding 25 miles an hour, the burden is upon him of showing that he was not operating recklessly, or without regard to the width, traffic and use of the highway.

"Of course, it is possible that traps will be maintained under the new law," says Mr. Schutz, "and that people will be convicted on the arbitrary statement of witnesses that they were operating 'recklessly,' but appeals to the Superior Court in a few such cases will put an effective *quietus* upon such proceedings. Furthermore, as all fines must be remitted by the local justices to the State for highway purposes, I am confident that much of the local enthusiasm for traps will be dispelled. Both the Massachusetts and Vermont laws make driving at 20 and 25 miles an hour, respectively, *prima facie* evidence of improper driving. The new law in Vermont is working exceedingly well. I have just returned from a three days' trip in that State and hear nothing but praise for it. I am confident that the Connecticut law is likewise a tremendous advance over the old forms of automobile legislation, which provided an arbitrary speed limit."

MASSACHUSETTS AUTOISTS AGAINST RE-REGISTRATION

WORCESTER, MASS., July 29.—The Worcester Automobile Club took the initiative among the clubs of the Massachusetts State Automobile Association in protesting against the new re-registration law of Massachusetts at a special meeting of the active members of the club Thursday night. After listening to talks by members and by Attorney Francis Hurtubis, Jr., counsel for the State Association, these resolutions were passed:

That the club members be advised in paying re-registration fee of $5 to do so under protest, and that the club attorney furnish a form of protest to the assistant secretary, to be transmited by him to the members.

That it is the sense of Worcester Automobile Club that the Massachusetts State Automobile Association should test and bear the expense of testing the constitutionality of Chapter 580, of the legislative acts of 1907.

In consequence of the first vote, Vice-President Daniel F. Gay, counsel for the club, furnished Assistant Secretary R. M. Pratt with a form reading: "This payment is made under protest and by paying it I waive no rights," and this has been used by many of the members when applying for re-registration of their cars. Because of the second vote, the State Association and the legislative committee thereof have been notified of the club action by President John P. Coghlin, and all of the clubs in the State have been likewise informed by the assistant secretary.

The action of the club is being endorsed by many non-members of the club, who have written it testifying to their endorsement and expressing their satisfaction that the club is taking the matter up. The Brockton, Mass., club will have a meeting to take action on similar lines.

At the meeting Thursday night it was stated by members who had consulted counsel on the matter that they are satisfied the annual fee of $5 for registration of cars is clearly unconstitutional, and there will be a test case taken to the United States Supreme Court if the wishes of several of the leading members of the club are carried out. Most of the members of the club are applying for their re-registration and are paying their $5 fee, which is due August 1, under protest, with hopes that the law will be declared unconstitutional and the fees returned.

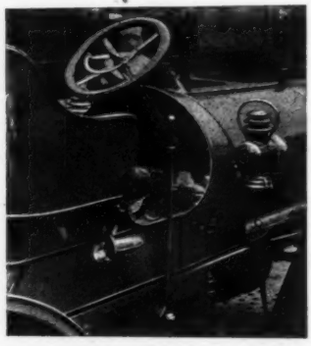
BUFFALO'S AUTO TAX DECLARED UNCONSTITUTIONAL

BUFFALO, N. Y., July 29.—Members of the Automobile Club of Buffalo are in a pleasant frame of mind over the decision of Judge Hodson of the Municipal Court, who, on last Saturday afternoon, declared the local ordinance requiring automobilists to pay an annual tax of $5 was unconstitutional. The ruling was given in the test suit brought by the city of Buffalo against Dai H. Lewis, secretary of the club. At the behest of Secretary Lewis the club members declined to pay their tax some time ago and the city took steps to enforce its ordinance by virtue of a court ruling. It has lost.

Judge Hodson, in his opinion, says: "The charter amendment, in providing for the imposition of a tax and penalty upon an owner of an automobile 'for the privilege of operating, driving or propelling the same along or upon the streets of Buffalo, and authorizing the Common Council to prohibit the use of such streets and public places of the city by such owner who refuses to pay such tax and penalty,' so plainly contravenes the provisions of the general motor vehicle law that it does not admit of serious discussion. Nor does it matter that the Common Council, in framing the ordinance, has gone to the extent of preventing the automobile from using the streets, as authorized by the law; the ordinance is passed pursuant to that law, which law is inconsistent with and contrary to the provision of the general law, and is therefore repealed by Section 7 of such general law; and the law authorizing the ordinances being repealed, clearly the ordinance itself becomes null and void."

While the decision is regarded as a big victory by local automobilists, the proposition of the Board of Assessors to make autos personal property assessments is causing much serious thought on the part of autoists in this city.

THOUGH apparently of standard design throughout so far as external appearance goes, the new Griswold runabout depicted here, and which is the work of J. P. Lavigne, well known to the automobile trade through the force-feed oiler that bears his name, stands revealed as something very much out of the ordinary, once its bonnet is lifted. A review of its specifications—5 by 5 inch, 16-horsepower, two-cylinder opposed motor, friction transmission, shaft drive, and similar details—gives no inkling whatever of the unusual arrangement in which these various essentials are grouped.

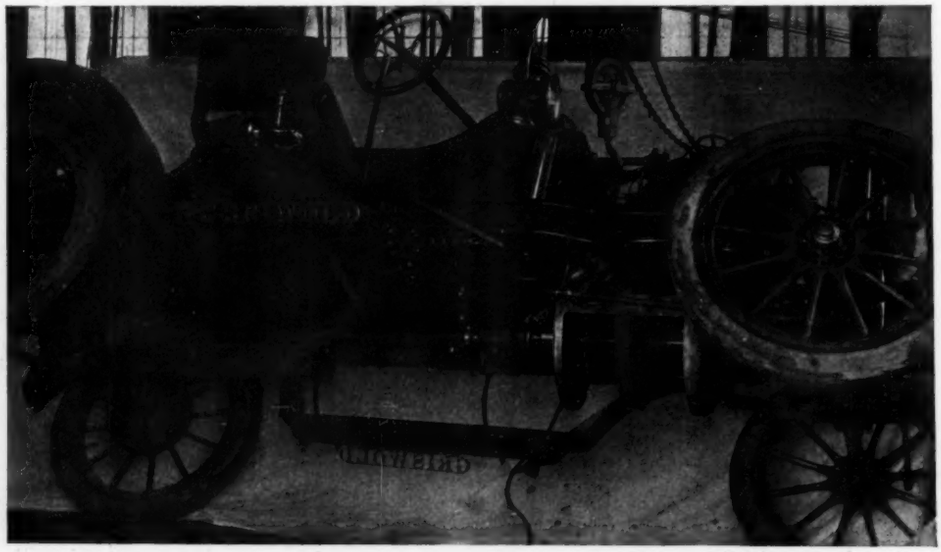


OPERATING LEVERS AND DASH.

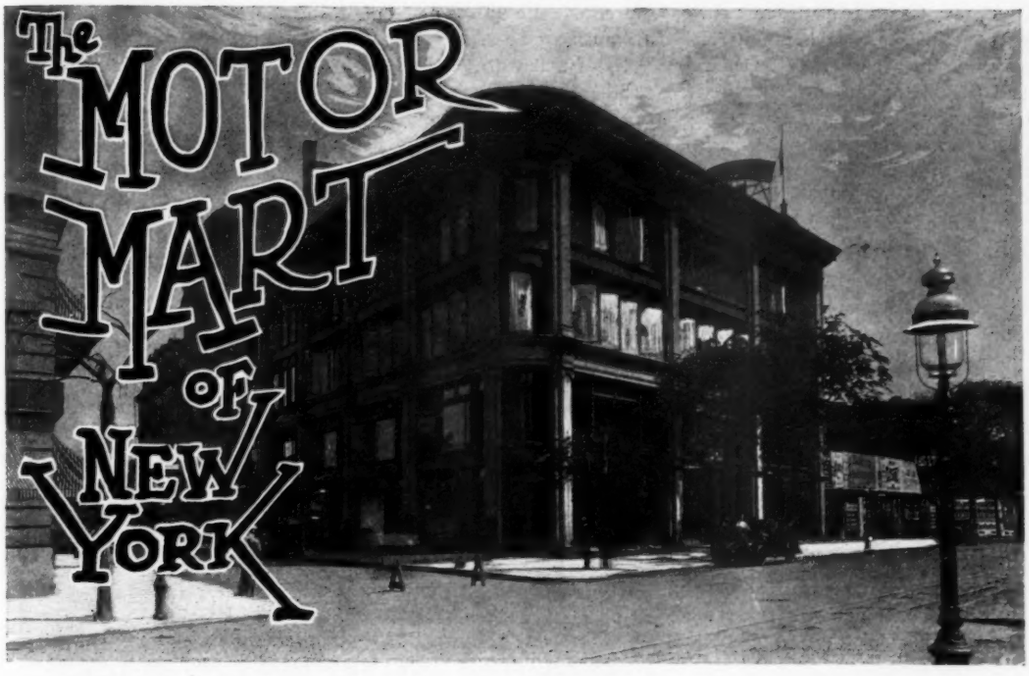
The motor is of the standard four-cycle, two-cylinder opposed type, barring minor changes necessitated by the position in which it is placed, which is longitudinally under the hood, with the flywheel underneath and the crankshaft vertical. Beneath the flywheel is placed a friction wheel, making contact with it. This friction wheel is arranged to slide longitudinally on a level horizontal shaft and is splined on it so as to turn with it. An extension of this horizontal shaft to the bevel gearing on the rear axle comprises the drive, one universal joint being interposed. Another unusual feature that is bound to attract the observer's attention at first sight is the starting device. The upper end of the crankshaft terminates in a bevel pinion meshing with another of about half the size on a horizontal shaft that extends rearward through the dash of the car, its end being fitted for the reception of a starting crank of the ordinary type, so that the car may be got under way from the seat, even though it be necessary to crank it. As it does not interfere with anything, this horizontal shaft may be allowed to turn without inconvenience, but provision is made for taking the small bevel out of mesh by means of a hand nut.

The position of the engine has been taken advantage of to install a unique and extremely simple system of lubrication. The crankshaft is partly hollow down as far as the center of the lower bearing. At the middle of each crank and pin bearing is a radial hole, one lead of a three-feed Lavigne oiler connecting with the hole in the upper bearing of the crankshaft, passing down through the hollow shaft by gravity and out on the crankpins and lower bearing, the surplus collecting in a circular groove at the bottom of the case, from which it is again brought into action by a small scoop attached to the lower web of the crank. The other two feeds from the oiler are taken to the tops of the cylinders at a point registering with a groove on the pistons when the latter are on the upper dead center, an oil ring being placed at the outer end to aid in spreading the oil. As a further means of lubrication, particularly in case one of the bearings should run hot, a compression grease cup is attached to the upper end of the crankshaft. As at present arranged, the oiler is placed quite high and driven by a belt, but it is the intention to lower it and use a gear drive. A Briscoe cellular radiator completes the cooling system of the car, which operates on the thermo-syphon principle, while a Heinze coil and Quad timer, and a battery of dry cells constitute the ignition system.

It may appear at first sight as if the new Griswold car were the first born of some amateur entrant into the field with a cherished theory to realize, but as a matter of fact Mr. Lavigne is really one of the pioneers of the industry. As far back as 1899 he built a car driven by a three-cylinder, vertical, two-cycle engine located under the body and driving through spur gears to the rear axle. The engine had a 4½-inch bore and stroke and in 1902 it was built into a larger car than had marked the first attempt. In this instance an individual clutch system was employed to give the speed changes and the drive was by means of spiral gearing. The wheelbase was 110 inches and the body a side-entrance tonneau, while the engine was placed in front and the drive was by means of a horizontal shaft, so that the car combined all the features of present-day construction. In 1904 Mr. Lavigne designed another smaller car, known as La Petite, of which a small number were built. The plans of the company include the building of a 10-horsepower runabout with a 90-inch wheelbase, a 15-horsepower touring car with a 100-inch wheelbase, and a 20-horsepower touring car with a 110-inch wheelbase. The builders are the Griswold Motor Car Company, Detroit, Mich., recently organized with a capital of $200,000, and with headquarters at 521 Lincoln avenue.



UNDER VIEW OF THE GRISWOLD CHASSIS SHOWING FRICTION TRANSMISSION.



WITHIN the past few years the development of New York's automobile row has been little short of stupendous. Some of the more prominent American manufacturers have invested amounts of capital in providing quarters for their branch houses and have erected buildings of a nature that leaves little doubt as to their faith in the permanency of New York City as a selling center for the automobile. But while such houses have been erecting the palatial buildings—for they are nothing less—that dot upper Broadway at intervals of a block or two for a matter of two or three miles, a similar amount of attention has not been paid to the needs of the smaller manufacturer.

Recognizing this, a corporation known as the Motor Mart of New York has been organized by A. T. Otto and F. E. Malone to develop the possibilities of the building located at the corner of Sixty-second street and Broadway and which has been christened the Motor Mart. This structure was originally erected more than a year ago, especially with a view to housing automobile garages, but its builders evidently had little definite conception of the requirements of this business. It is of steel and concrete construction throughout and modern in every respect, but aside from being fireproof it was hardly any better adapted to the purposes of a garage before its present holder took possession than are many buildings which were never designed for the purpose. It had 30-foot ceilings but was totally minus either elevator or heating service. This the new company has remedied by building in two additional floors as well as installing large electric freight and passenger elevators and a steam heating plant, in addition to which other facilities will be provided. The building measures 116 feet on Broadway and runs 173 feet east on Sixty-second street. At present it provides 14,000 square feet of surface per floor, but, with the addition of a 25-foot L extension facing on Sixty-first street, it will have 17,000 square feet on each floor, of which there are four and two light basements.

Its most distinctive feature when running in full blast will be a permanent exhibition of automobiles, accessories and the like, to which the entire fourth floor is to be devoted. With a view to making the building as light as possible, a very large proportion of the walls is composed of glass, as may be judged from the photograph of the interior showing the fourth floor. The space afforded by the latter is to be divided into 50 combined offices and salesrooms, which are to comprise the units of the permanent exhibition referred to. Under prevailing conditions it is now very difficult for the small out-of-town manufacturer who is not otherwise represented in the metropolis to obtain adequate space and facilities in New York's automobile row, and due both to its favorable location and the excellent facilities it affords for the purpose, there seems to be little doubt that the idea will appeal favorably to a sufficient number of small manufacturers to make the holding of a permanent exhibition of the kind a feature of the New York trade.

That the selling end of the New York industry, which found itself indifferently situated with regard to quarters when the new Motor Mart was thrown open, has not been slow to recognize the advantages of location and up-to-date housing afforded by the latter, is shown by its present roll of tenants, although the work of remodeling the building is not yet quite complete. For instance, at its southerly end, the Diamond Rubber Company has established its New York branch house in a manner equaled by few similar establishments in the world. The original 30-foot ceiling of the building was left undisturbed with the exception of the rear end of this imposing office, which has been bridged by a special balcony. The fittings are in keeping with its size and prominence. Other tenants on the Broadway side of the

ONE FLOOR OF THE MOTOR MART DESIGNED FOR A PERMANENT CAR EXHIBIT.

ground floor are the Mitchell Motor Car Company, of New York, handling the Mitchell gasoline pleasure and commercial vehicles, while on the Sixty-second street corner the General Vehicle Company, of Long Island City, shows some of its large line of electrics. Back of the latter, on Sixty-second street, is the branch house of the Oscar Lear Automobile Company, builders of the Frayer-Miller cars, while just behind them is the Motor Sales Company, which concern represents the interests of the Detroit builders of the De Luxe car. The New Amsterdam Oil & Grease Company and the Ennis Ruef Tire Company complete the list at present on the ground floor, though the Colt runabout is a prospective addition, while the Imported Car Repair Company is located in the basement, though it is the intention of the corporation to lease part of the latter together with the upper floors to those firms requiring combined office and garage facilities.

On the second floor, along the Broadway side, Percy Owen has already installed the Bianchi cars in an elaborate setting, another well-known firm which has taken up its headquarters here being the Winchester Speedodometer Company. Other firms on this floor are the Tiger Tire Company, the A. Franck Company, the W. L. Fry Company, J. T. Finn & Co., and the Auto Specialty Company, while the shock absorber contingent is to be represented by the Kilgore Shock Absorber Company. On the same floor the Automobile Trade Association and the Automobile Press Association both have their headquarters.

At the present writing both the third and fourth floors are still undergoing the finishing touches of the reconstruction process in order to fit them for the purpose in view, as is also the case with some of the other details of the building, but with the latter housing its full complement on three floors and with the Motor Mart exposition a permanent feature of the fourth, it will represent a center of automobile activity of which there are few equals in the country.

JUST AS IT CAME FROM PELLETIER'S PEN.

Furnished by the Press Bureau of the Ford Motor Co., Detroit, Mich.

It wouldn't have happened if his name had been an unusual one; but his name is Smith, and he lives in a small town in Vermont.

He owns a Ford runabout that he purchased from Charley Fay, manager of the Ford Boston branch. The car had been running fine for several months, and Smith had written several times to say how delighted he was. But one day there came a change in the form of a letter that detailed all the ills a motor car is heir to, and winding up with a request for immediate information as to what to do to make the motor perform as of yore. Fay diagnosed the case as well as he could, and sent him a bunch of "absent treatment" by return mail. But it was of no use. A telegram stated all the expedients suggested had been tried, but the motor would not "mote." Fay wired for more symptoms. In reply he received information that the engine, after much cranking, would start, run for a few seconds, smoke, spit and emit a terrible stench. "Seems as if it is running hot," ended the telegram. Fay suggested examining the pump, commutator, carburetor, coil and everything else he could think of, and concluded by advising to "Put plenty of oil in the engine base." Simth replied, "Nothing doing." Then Fay got him on the telephone.

"What kind of cylinder oil are you using?"

"Same as you sent me last week," replied Smith hotly.

"That's good cylinder oil," said Fay; "but I cannot understand the engine heating. Put in some more oil."

"Got the case half full now," yelled back Smith.

"Well, put in some more," replied Fay, as he slammed the receiver back on the hook.

In half an hour a telegram told Fay he could send an expert to make the car run or take back his old machine.

It was in the middle of the selling season. Runabouts were going at the rate of ten a day, and every competent man was required to tune up the new ones. But there was no way out of it—a man must be sent.

"Half a day to go, half an hour to make the engine run, and another half day to return," growled Fay. "Wish that fellow could think of one symptom he didn't tell me, so I could tell him what ails his car."

Man was absent three days. When he returned he met the infuriated manager, who asked: "What on earth kept you so long; what have you been doing?"

"Took his engine all apart, cleaned it, and put it back in."

"Why—what was wrong with it?"

"This," said the man, setting a can of light brown liquid before his chief.

"That looks like good cylinder oil," said Fay.

"Looks like it—yes—that's the trouble. It's maple syrup!"

Strange as it may seem, there are two Smiths in this Vermont town. A friend had shipped a can of maple syrup to one, on the same day and by the same express company that was carrying the can of cylinder oil from Fay to the Ford owner. Cans got mixed en route. When the expert took the motor apart he found the cylinder full of maple sugar, the bearings full of syrup, and the muffler choked with the half-burnt wax.

Fay is now wondering how the other Smith relished the cylinder oil on his pancakes.

TWENTIETH CENTURY HUNTING IN TEXAS.

DALLAS, TEX., July 27.—Probably for the first time in its history has the automobile been utilized in the rôle of the hunter's steed. As an aid to hunting, it has become almost common, but its rôle has been confined to that of a method of transportation and nothing more, though its ability to cover long distances has made it particularly valuable for this purpose. In the instance under review it actually played the part of hunter. A party left Tahoka, Tex., in two touring cars one day last week and proceeded about twenty miles east of that place on the J. B. Slaughter range. Three antelope were jumped on the open plain and both cars were immediately started in chase. The antelope has always been considered the swiftest runner that walked on four legs, and any attempt to chase it previously would have been worse than useless. Even with the superior speeding powers of the automobile, seven miles were covered before the fleet animals were overtaken and one of the party, skilled in the use of the lasso, easily roped a big buck from the front seat of the car, which was subsequently released. This is doubtless the first case on record of an antelope having been run down, and it goes without saying that the seven-mile chase provided sport of a rarely exciting nature. The party was composed of Judge F. M. Bartley, W. S. Swan, Dr. S. H. Wyndom and T. Simmons, of Tahoka; H. Ford, of Austin, and O. B. Helley, of Garza county, Tex.

There is a movement afoot to provide the public commissioners of Dallas with an automobile for their use in traveling round the town, many of the business men of the city being enthusiastic about the project, even to the extent of planning to circulate a monster petition in its favor. But Mayor Hoy and Commissioner Doran have thrown cold water upon it as a luxury to be foregone until the time when the automobile can be operated more economically than at present.

PIERCE MAKES BIG FACTORY ENLARGEMENT.

BUFFALO, N. Y., July 29.—Additions are to be made to the factory facilities of the George N. Pierce Company by the erection of a third story to the body-building department, giving an increased floor area of 45,000 square feet. The contract for the work has been awarded to the Trussed Concrete Steel Company of Detroit. In building their new plant, which has a floor area of over 325,000 square feet, and was completed less than a year ago, the Pierce Company secured a fifteen-acre tract advantageously situated on the old Pan-American Exposition grounds, with the New York Central belt line close at hand to facilitate shipping.

A FORD CHAPTER OF SELDEN ACTION.

As the testimony in the so-called Selden litigation—the action of the Electric Vehicle Company *vs.* the Ford Motor Company, over the Selden patent—now totals more than 6,000 long typewritten pages, it is hardly to be expected that anyone other than those directly interested would be apt to remember any details of it. But Dugald Clerk, who was brought over from England by the complainants as an expert witness, on the stand admitted that the Lenoir patent undoubtedly antedated that of Selden by many years, but was positive that such an engine could not be built light enough to allow of its application to a road vehicle. Henry Ford seized the opportunity thus presented and built a 7 by 7 Lenoir engine, on which the patent dates back to the early sixties and equipped it with a Festugier carbureter that was especially designed to be used in connection with the Lenoir engine and was patented in 1865. The whole was mounted on a regular 1903, single-cylinder Ford chassis, and neither in its action nor its appearance, with the exception of the huge barrel-like brass carbureter fastened to one side of the body, and which measured 8 by 24 inches, could the car be distinguished from the standard product of that day.

It was put through its paces on Monday afternoon last in the vicinity of the Broadway store of the Ford Company for the benefit of a number of the witnesses on both sides and a gathering of scribes, who took turns in testing its ability. It was run backward and forward at a good pace, started easily by cranking from the seat, and was even started on the spark, showng that it was thoroughly broke and could perform all the regulation stunts that any well-bred automobile could be expected to do. Its ability to run throttled down would easily gain it a record, as it would run so slowly with the throttle closed that a stop seemed imminent between explosions, despite which it could be speeded up and the car made to travel at a rate that would easily break more than one speed law.

This and a great deal more were maters of common observation by those present, and they were duly enlarged upon by the press agent. Those who viewed the test included Prof. R. C. Carpenter, of Cornell; Charles E. Duryea, consulting engineer of the A. M. C. M. A.; John P. Murray, attorney for the Panhard interests; Hugo Gibson, one of the expert witnesses brought over by the complainants at the same time as Dugald Clerk; Judge R. A. Parker, the Ford attorney; Jesse Smith, a Ford expert; Alfred Reeves, general manager of the A. M. C. M. A.; R. S. Crawford, of the Crawford Motor Car Company; Gaston Plaintiff, manager of the New York branch of the Ford Company; Paul Lacroix, of the Renault Company, and R. M. Barwise.

During the morning of the same day a demonstration was given of the old Selden motor, which, however, was not public and was only attended by the lawyers and witnesses on both sides. It was not said to have been an unqualified success, but the publicity department of the Licensed Association did not wish to make any statement regarding it on the ground that it in no way concerned the litigation in question.

GEORGE DAY REJOINS LICENSED ASSOCIATION.

Due to the recent resignation of M. J. Budlong as president of the Electric Vehicle Company, Hartford, Conn., a somewhat unexpected result has followed in the election of George H. Day to fill the vacancy thus created in the Executive Committee of the Licensed Association of Automobile Manufacturers. It will be recalled that Mr. Day for some time held the presidency of the Electric Vehicle Company, and only recently resigned the general managership of the Licensed Association, so that it would be difficult to find any one more thoroughly conversant with the affairs of both organizations. On this account, the Electric Vehicle Company requested that Mr. Day be elected to fill the vacancy created by Mr. Budlong's resignation, which was done at the meeting on Tuesday. He will not resume his connection with the company in any official capacity on that account.

AUTO ENGINEERS MEET AT BUFFALO.

The midsummer meeting of the Society of Automobile Engineers, held in Buffalo on Monday and Tuesday last, was combined with that of the Mechanical Branch of the Association of Licensed Automobile Manufacturers.

Sessions were held on Monday at the rooms of the Automobile Club of Buffalo, papers being read on steels and their properties in the morning, which were followed by an extended discussion of the magneto during the afternoon and evening. This included the reading of a paper by E. T. Birdsall, chairman of the committee on magnetos of the Society of Automobile Engineers. The paper was profusely illustrated by lantern slides. Otto Heins, representing Robert Bosch, advocated a closer relationship between the automobile manufacturers and the magneto makers.

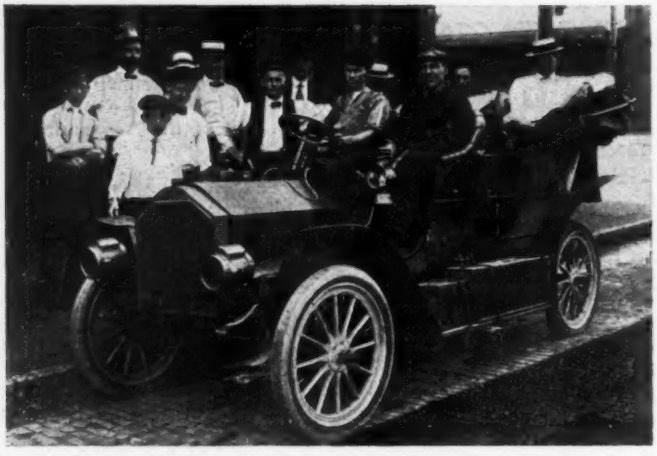
The remainder of the meeting was devoted to an inspection of the plants of the E. R. Thomas Motor Company and the George N. Pierce Company, which are said to be the largest and most completely equipped of their kind in the world. After going through the Pierce plant, the engineers were taken over into Canada for a ride in a number of Pierce and Thomas cars, crossing the river and returning via Lewiston and Niagara Falls to Buffalo.

The following members of the Mechanical Branch were present: H. E. Coffin and F. P. Nehrbas, E. R. Thomas Company; A. L. Riker and E. F. Russell, Locomobile Company; Charles B. King, Northern Motor Car Company; D. Ferguson and Duncan H. Pierce, George N. Pierce Company; Charles R. Greuter, Matheson Motor Car Company; E. T. Birdsall, Selden Motor Vehicle Company; C. E. Calkins, Studebaker Automobile Company; J. G. Perrin, M. Z. Viau and M. S. Young, Lozier Motor Company; G. A. Dunham and R. M. Jackson, Olds Motor Works; Lindley D. Hubbel and Frank W. Cooke, Pope Manufacturing Company; Henri G. Chatain, Waltham Manufacturing Company; H. P. Maxim, Electric Vehicle Company; John Wilkinson, H. H. Franklin Manufacturing Company; J. A. Baumgardner and John G. Utz, Autocar Company; J. S. Worthington, Haynes Automobile Company; Frank Johnson and E. E. Sweet, Cadillac Motor Car Company, and Walter L. Marr, Buick Motor Company.

GARFORD COMPANY ENTERS LIST OF MAKERS.

Behind the simple announcement that the Garford Company has decided to enter the automobile market proper with a car to be known as the Garford, rated at 40 horsepower, and which will be on view in October next, lies one of the most radical changes in the New York trade that has occurred along the "row" in many months. William B. Hurlbut and C. R. Teaboldt, respectively manager and assistant manager of the Packard Motor Car Company's branch in this city for the past three years, have severed their connection with the latter firm to organize the Garford Motor Car Company of New York, of which Mr. Hurlbut is president and general manager and Mr. Teaboldt secretary and treasurer. The new company is capitalized at $300,000.

The importance of the entrance of the Garford Company into the automobile field will be realized when it is stated that a very large percentage of all the automobile parts of several kinds that are manufactured in this country have their origin at this concern's factories in Cleveland and Elyria, O. It was among the very first to take up the making of automobile parts on a large scale, and has done a tremendous business, so that the extent of its facilities for turning out work of this kind places it in an excellent position to build complete cars. Messrs. Hurlbut and Teaboldt recently made a test trip in one of the first Garford cars and were so pleased with it that they decided upon the action already mentioned, severing their connection with the Packard interests last Saturday. It is expected that the new car will be on the market in numbers by October 1, and that a detailed review of their specifications will be found to reveal a number of constructional innovations, though the car as a whole is patterned strictly along recognized lines of standard practise.



AN INDIANA CAR THAT MADE A LONG SOUTHERN TRIP.

The Model car above illustrated recently completed a trip from the company's factory at Peru, Ind., to Tampa, Florida, over the mountain roads of Kentucky and Tennessee, said to be the worst in the country. Mr. Hixon, the Tampa agent, made the trip to demonstrate the fact that a two-cylinder car could do it.

ELECTRIC 'BUSES PLEASE QUAKERS.

PHILADELPHIA, July 29.—After a fortnight's operation, the initial line of automobile omnibuses established by the Auto Transit Company, of this city, has been pronounced by the Quaker City public as an unqualified success. Harassed for many months from every side by grafting politicians in city councils, who seemed unwilling to grant a long-suffering public the boon of a much-needed addition to its transportation facilities, the Auto Transit people persistently stuck to their guns, and finally won out when, early in the present month, Mayor Reyburn signed the ordinance which gave them a legal right to operate their vehicles on the Broad and Diamond streets route between the Bellevue-Stratford and the Diamond street entrance to Fairmount Park.

Although but twelve of the twenty-five vehicles which will constitute the rolling stock of this initial route are in operation, owing to the incomplete state of the company"s charging plant and garage at Thirty-third and Dauphin streets, the full complement of 'buses will be put on the line by next Monday, by which time the additional motormen and conductors who are now being drilled will be ready to take hold. With its present equipment the company is starting one of its 'buses from each of the termini every seven minutes. By August 15, says General Manager J. M. Hill, the line will be run on a three-minute headway, and if necessary the 'buses will, by October 1, be running under a one-minute headway during the morning and evening rush hours. When the present line is firmly established, the Auto Transit people will turn their attention to the southern line, in all probability running south on Broad street to League Island and return, with possible feeders on an east and west street with free transfers.

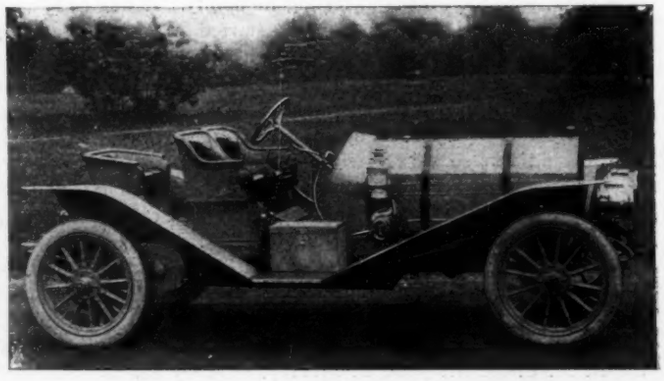
The five-cent fare with no one allowed to stand—a policy which the Auto Transit Company announces it will adhere to—is meeting with the approbation of the local public, and the 'buses are running full in both directions at all hours of the day.

The Commercial Truck Company of America, which built the vehicles for the Auto Transit Company, is working night and day on the second installment of 25 'buses, which will be slightly larger and capable of carrying 40 passengers each as against the seating capacity of 36 of the vehicles now running. The 'buses are all built under the Imperial four-motor four-wheel-drive patents, each motor being 2 1-2 horsepower.

ONE OF THE NEW MOTOR 'BUSES THAT PHILADELPHIA USES.

GREAT CHADWICK SIX TOURABOUT FOR 1908.

At first glance it would scarcely be realized that the power plant of the natty car shown by the accompanying photograph was fitted with a six-cylinder engine, so well proportioned are its lines throughout. It is the runabout counterpart of the Great Chadwick Six, recently described in detail in these columns, and has been christened a tourabout, owing to the unequaled facilities it offers for this service. Special attention has been paid to making it as attractive and compact a car as possible, and wherever alterations from the touring car were necessary to attain this end they have been made, so that it is not merely a runabout body on the same chassis, but a special design which really speaks for itself in this respect. The makers are devoting considerable attention to this model and quite a number are being produced for the coming season.



HOW THE GREAT CHADWICK SIX TOURABOUT SHOWS UP.

TRADE DOINGS IN QUAKERVILLE.

PHILADELPHIA, July 29.—The local automobile trade was recruited last week by the advent of W. L. Edison, son of the inventor, who will represent the 40-45 Colt Rapid Fire car locally. He is associated with H. M. Fernald of this city, and will temporarily carry on business at the Bellevue-Stratford garage. Later the new concern expects to establish quarters on "Gasoline Row."

George Barbier, the well-known actor, but recently connected with the local Rambler branch house, has decided to return to his Thespian first love, and, in company with Eddie Middleton, will form a stock company for a season at the Forepaugh Theater.

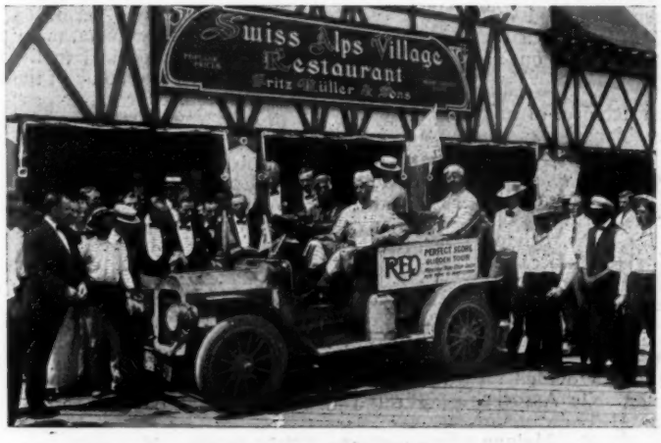
Gilbert S. Smith, head of the Hamilton Auto Company, local Stoddard-Dayton agents, and who has attained fame by entering his cars in every competitive event he could conveniently reach—and winning out—has found it necessary to considerably enlarge the company's present quarters at 206 North Broad street. He ascribes the Stoddard's rapid jump in popularity to the wide publicity given the car's triumphs in the local and trade press throughout the entire country.

RULES FOR BRIGHTON BEACH 24-HOUR RACE.

For the August 8-9 twenty-four-hour contest, to be held at Brighton Beach, N. Y., under the auspices of the Long Island Automobile Club, A. R. Pardington, acting chairman of the A. A. A. Racing Board, has issued special rules for this form of racing. Two kinds of twenty-four-hour races are provided for. Class A is an endurance race limited to one car and only two drivers, while Class B is a relay event in which two cars of the same kind may be used with not more than three drivers to pilot them. Regulation stock cars, described in manufacturers' catalogues, are the only vehicles permissible in these long events. Extensive preparations are being made for the Brighton Beach event.

MAXWELL OFF FOR CHICAGO, BONNET NAILED.

It was a more than ordinary sealed bonnet test that the little 16-20-horsepower Maxwell undertook when, after traveling about 1,500 miles, it joined in the Glidden tour and came eastward to New York. Still with its bonnet nailed down, it has started westward again and expects to reach Chicago without any tinkering with the seals. The start was made from 317 West Fifty-ninth street, New York, at 10 o'clock on Wednesday morning.



THE "16" REO AT THE SWISS VILLAGE, JAMESTOWN

To show that the strenuous two weeks of the A. A. A. Tour were far from being a measure of its capacity to get there and back, the 16-horsepower Reo was started on another journey to Jamestown immediately after the conclusion of the tour and without making any adjustments or repairs. The trip was made as non-stop dash and was finished in 24 hours without an incident.

FROM NEW YORK TO BUFFALO IN 21 HOURS.

BUFFALO, N. Y., July 29.—With the Packard "24" which he had driven in the 1906 and 1907 A. A. A. Tour, Gus. Buse, Jr., started from the Knickerbocker Hotel in New York on Thursday morning last, after the completion the day before of the big tour, and arrived in Buffalo in twenty-one hours. Roads between the two cities a great part of the way were dusty and in poor condition.

NEW FIRM TO BUILD AIR-COOLED CARS.

COLUMBUS, O., July 29.—Under the title of the Harmer Motor Car Company of Columbus, a company has been incorporated here with a capital stock of $100,000 to build automobiles employing a new air-cooled motor, which is the invention of Frederick S. Harmer. The motor is cooled on the blower principle and 40-horsepower touring cars and runabouts, as well as a three-ton delivery truck, will be turned out on a large scale. One of the cars, which was built recently, has shown up very well under test and it is the intention of the company to build or lease a manufacturing plant and begin business in the near future. The incorporators are Frederick S. Harmer, P. Scott Stafford, E. H. Holterman, J. E. Ward and W. M. Parsons.

J. W. DAVID IN A MORA ON A STIFF GRADE

TESTING OUT MORA CARS IN THE HILLS.

Western New York offers an unusually favorable testing-out ground for cars, as is evidenced by the accompanying photograph, depicting John W. David driving a Mora car up what is claimed to be a 45 per cent. grade, on the high gear. Newark, N. Y., where the factory of the Mora Motor Car Company is located, is situated close to Rochester, of which it is practically a suburb, and it is surrounded by numerous hills and endless miles of rough roads, which appealed to the builders of the Mora very strongly as a testing ground, and really constituted an inducement toward locating the works there. J. W. David, the driver, is the son of William P. David, president of the Kelsey Motor Car Company, Philadelphia, who are agents for the Mora in that territory. Young David is the possessor of a number of trophies won on the Point Breeze track, and since going with the Mora people has developed into one of the company's best testers.

BRUSH TO MANAGE PACKARD N. Y. BRANCH.

W. A. Brush, formerly assistant to S. D. Waldon, general sales-manager of the Packard Motor Car Company, Detroit, Mich., has just succeeded W. H. Hurlbut, as manager of the company's New York branch, due to the latter's recent resignation to go with the Garford Company, as detailed elsewhere in this issue. Mr. Brush is one of the old-timers of the selling end of the automobile trade, and was formerly associated with W. A. Metzger in the sales department of the Cadillac Company in Detroit.

A FRANKLIN IN ONE OF ITS DUAL ROLES

Carl Hohoff, manager of the Alaska Fur Company, Grand Rapids, Mich., gets all there is to be had in the way of service out of his Franklin car, which he utilizes for business purposes in the delivery of furs and for pleasure by substituting a detachable tonneau in place of the delivery box shown in the photograph.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY.

Allen Pirie, of Carson, Pirie, Scott & Co., Chicago, has bought the famous Tincher 80-horsepower racer and it is now converted into a high-powered roadster for Mr. Pirie's use.

The Warner Gear Company, Muncie, Ind., is adding a two-story factory, 155 by 144 feet, immediately adjoining their present plant, and expect it to be in use within sixty days.

Cullman Wheel Company, 1027 Dunning street, Chicago, have added two stories to their main factory building and are equipping it with additional machinery to take care of their increased business.

Out of the 48 cars that finished the strenuous two weeks' run of the recent A. A. A. tour, 36 cars, or 75 per cent. of the entire number that completed the distance, were equipped with the Warner Auto-Meter, according to the makers of the latter.

The Pierce Engine Company, Racine, Wis., will have for 1908 a line of three cars: a 40-horsepower four-cylinder, $3,000; a 30-horsepower four-cylinder, $2,000, and a 24-horsepower, two-cylinder, $1,350, details of which will be announced shortly.

Pancho Hernandez, a Puerto Rican who is the proud owner of a Winton Type X-I-V, has been showing the natives what it can do, and recently established a new record over the military road from Ponce to San Juan, covering the distance in four hours.

E. R. Thomas is again to head the E. R. Thomas Motor Company, of Buffalo, as president, having just been re-elected to that office at the annual meeting. The other officers for the ensuing year are: Edwin L. Thomas, vice-president; J. M. Edsall, treasurer, and Ellicott Evans, secretary.

The Raino Company, manufacturers of automobile waterproof clothing at 735 South Halsted street, Chicago, have just booked an order for 5,000 military capes to be supplied to the Cuban Rural Guard, the order being secured in the face of considerable competition, as bids were publicly advertised for on this equipment.

The Bellefield Motor Company, of Pittsburgh, has been incorporated with a capital of $100,000, making it one of the largest concerns of its kind in the Steel City. The incorporators are: Charles M. Johnston, J. H. McClaren, John H. Langdon, Frank P. Blackmore and George D. Kelley. It is the intention of the company to operate in the East End.

Buffalo's aldermanic committee on fire protection having reported in favor of purchasing an automobile for the use of Fire Chief McConnell, bids were advertised for a high-powered car. The E. R. Thomas Motor Company offered a Thomas Flyer at $4,000 and the George N. Pierce Company tendered a Pierce Great Arrow at $3,000, their offer being accepted.

At least one of the towns along the Hudson has come to the conclusion that 10 miles an hour is too low a speed limit for automobiles and has decided that an increase of 50 per cent. would still be within reasonable bounds. This is Irvington-on-the-Hudson, the village authorities of which have recently decided to raise the permissible speed limit to 15 miles an hour.

In the recent A. A. A. tour figures compiled for the Diamond Tire Company showed that the 72 cars in the run used a total of 95 tires in addition to their original equipment. Of this number, 33 cars equipped with Diamond tires are said to have used but 14 tires all told in addition to those on the wheels at the beginning of the tour, and in no case, it is said, were Diamond tires responsible for a penalization.

As a result of the action of Director of Public Works Shepard in putting out of business a 'bus line that had no franchise and the fares of which were said to be extortionate, public sentiment is growing in favor of the city of Pittsburgh, undertaking the work of running an automobile 'bus line through Highland and Schenley Parks for the benefit of the thousands of people who visit them.

"It's surprising the good influence it has over employees for them to hear that their factory's product is making good," says Manager Schaaf, of the Pope Motor Car Company. "I can feel the results from the excellent reports we are receiving about our cars, even among our humblest laborers. Every one of the 1,800 men is imbued with the spirit of the Pope-Toledo enthusiasts and is going round with a chip on his shoulder."

Probably the largest manufacturer of tufting machines for making cushions, backs and upholstered parts is now the Novelty Tufting Machine Company, of Chicago, which has its machines in such well-known automobile factories as Pierce, Peerless, Pope, White, Thomas, Woods, De Luxe, Dayton, Oldsmobile, Buick, Whiting, Cadillac, Northern, Dolson, Dorris, Jackson, Reo and St. Louis. In addition eleven firms trimming cars for the trade are users of Novelty machines.

Roomy quarters having been provided for the New York Trade Automobile Association in the new Motor Mart, Broadway and Sixty-second street, by F. E. Malone. Manager E. V. Stratton says it will be the purpose of the association to place a meeting room at the disposal of any automobile interests desiring these facilities. Desks, chairs, and other necessary equipment will all be provided and doubtless the offer will be appreciated by the automobile fraternity, as the need of such a meeting room in a convenient location has long been felt.

In the counties of northeastern Ohio and the level portions of Pennsylvania north of Pittsburgh a movement is on foot for the establishment of a rural automobile mail service. Fairly good roads and the absence of many steep hills makes an automobile by far the quickest method of transportation. Several of the larger distributing centers have already inaugurated the practice and a few machines have been bought. It is claimed that, in addition to the greater rapidity of the service, the first cost of the machines will be more than offset by the greatly reduced number of carriers needed.

Appearances are certainly against the low, rakish-looking car in the eyes of the law, and that drivers of such turnouts occasionally have to pay for the privilege of looking sporty was well illustrated by an incident which came under the observation of Colonel Pardee recently. "We were running along at about 15 miles an hour," says the Colonel, "when a young fellow passed us in one of those smart-looking racers. He was not going particularly fast, and we kept right behind him in a Maxwell runabout, when suddenly a 'cop' stepped out and held him up. We were running at exactly the same rate of speed and no attention was paid to us."

The Auto Top and Trimming Company is the name of a newly organized concern at Pontiac, Mich., the officers of which are: President, E. M. Murphy; vice-president, R. F. Monroe; treasurer, O. J. Beaudette; secretary, M. L. Pulcher; manager, Frank Jacques. A building adjoining the P. O. & N. R. R., formerly used by the Pontiac Buggy Company, has been secured and is now being put in shape for use. It is the intention of this company to furnish bodies trimmed complete, as well as doing trimming and painting auto tops. Other accessories along the carriage line of automobiles will be manufactured also.

As the outcome of the spirited campaign that the New York Automobile Trade Association, working in conjunction with the American Motor Car Manufacturers' Association, has been waging against the steamship companies which have not permitted gasoline trucks to enter on their piers, many of the latter have now been opened to the modern commercial vehicle, and some of the other companies have the matter under consideration. At present the following companies have acceded to the demands of the association: The Enterprise S. S. Company, Brunswick S. S. Company, Maine S. S. Company, New York & Porto Rico S. S. Company, United Fruit Company, and the Ward line.

No. 31 in the Glidden tour, the Walter car entered by E. S. Lea, went through the severe touring competition without any preliminary tuning up, being shipped direct from the factory to the starting point, its preliminary mileage was less than 30. During the run the car shot over a 20-foot embankment wthout sustaining any injury, the motor still being running when the machine came to a stop. Although two hours were lost in getting on to the road again, control was reached 45 minutes ahead of time. One of the reasons claimed by the makers for the car's wonderful resistance is the use of chrome nickel steel springs, which were so efficient that no shock absorbers were needed.

That the number 13 is not always an illomen was amply demonstrated by the Thomas press car in the recent A. A. A. tour that carried this much-maligned numeral and alleged bringer of misfortunes. Probably few cars had less trouble to account for in the whole trip than did the Thomas bearer of the "hoodoo," as three nail punctures were the sum total of its trials. In the meantime, it helped cars out of ditches, lent a helping hand in case of tire trouble, and on one occasion picked up two passengers that had been left at the roadside by another car and carried them 80 miles into Chicago, making a load of seven and baggage. In spite of it all, every day's run was finished on schedule time.

Times have changed somewhat when instead of Americans paying premiums for foreign cars, things are reversed and foreigners have to pay more for an American car than it can be bought for at home. This is the case with the Ford cars, of which numbers are now being sent abroad. In Great Britain the runabout lists at £165 (about $800), while in Germany and Italy the demand is said to exceed the supply at $840. In Paris the runabout is said to command

$1,000, and the Ford Six, $3,700, as compared with its price of $2,800 here. The extent of the Ford export business may be gauged when it is stated that regular weekly shipments are constantly being made to England, Germany, France, Italy, Belgium, Austria and Sweden.

Just how much foundation there is for many of the alleged automobile "accidents" was well illustrated by one that took place in Buffalo recently. A girl on her way to work was knocked down by a bicycle as she was alighting from a street car, and was rendered unconscious by being thrown to the pavement. The response to the ambulance not being very prompt, the policeman hailed Charles Miller, one of the E. R. Thomas Company's testers, who was driving by, and the Thomas Flyer, with its oddly assorted trio, reached the General Hospital just as the ambulance was leaving. Within the next twenty minutes one of the daily papers had received telephone calls from no less than fourteen people telling how a girl had been injured by an automobile, the reports giving the car's speed as anywhere from 30 to 80 miles an hour, while the girl was thrown from 30 to 80 feet. Four people said that they had seen the accident, and one was quite certain the girl would not live the day out. Several people also called up the Thomas factory and read the telephone girl a lecture on the criminal carelessness of the automobile driver in general. In the meantime the girl was on her way home with nothing worse than a bad headache—caused by a bicycle.

RECENT TRADE CHANGES.

The De Luxe Motor Sales Company, of which S. B. McCoy is manager, has opened up at 1536 Michigan avenue, Chicago, and will sell De Luxe cars.

The McDuffee Automobile Company, Chicago, have given up the De Luxe and Kisselkar agencies and will hereafter confine their efforts to the sale of the Stoddard-Dayton cars.

The Brush McLaren Motor Company, 47 William street, Newark, N. J., have just been appointed general agents for the Brush runabout in the State of New Jersey. The company is managed by Thayer McLaren.

The Appeal Manufacturing & Jobbing Company, Los Angeles, Cal., who represent Morgan & Wright in Southern California, have removed from 940 South Main street to 631 South Los Angeles street. Morgan & Wright's Atlanta, Ga., branch has been removed from 49 South Forsyth street to 92 North Prior street, the establishment at the new location being one of the finest rubber goods stores in the entire South.

PERSONAL TRADE MENTION.

A. E. Vinton, formerly Cleveland manager of the G & J Tire Company, is now connected with the sales department at the factory in Indianapolis.

R. B. Wrigley, formerly associated with the press of Minneapolis and St. Paul, has been appointed advertising manager of the Excelsior Supply Company, Chicago.

Charles B. Shanks, general sales manager of the Winton Motor Carriage Company, Cleveland, O., has his line out for salmon trout in Lady Evelyn Lake, northern Canada.

The Winton Motor Carriage Company is sending Clarence B. Lincoln from the home office to its Seattle, Wash., branch house, where he will act as assistant to Manager Miller.

L. M. Eagye, formerly manager of the Beaver Manufacturing Company, of Milwaukee, Wis., has been elected secretary and general manager of the Franco-American Auto & Supply Company, Chicago.

B. N. Crockett has joined the sales forces of the Northern agency in the Motor Mart, Boston. Mr. Crockett has had long experience as a salesman and has a large automobiling acquaintance throughout New England.

C. C. Fairman has resigned his position as assistant general manager of the York Motor Car Company, Inc., York, Pa., and while it is his intention to continue in the automobile trade, no announcement of his future plans are forthcoming at the moment.

Frank E. Sparks, formerly manager of the auto department of the Excelsior Supply Company, Chicago, has been appointed Chicago Manager for the National Sales Corporation and Weed Chain Tire Grip Company and has opened an office at 1436 Michigan avenue, Chicago.

F. W. Ansley, eastern traveling representative of the H. H. Franklin Manufacturing Company, Syracuse, N. Y., was married July 10 to Miss Mabel McKellar, of London, Ont. Mr. and Mrs. Ansley expect to make their home in one of the larger cities in Mr. Ansley's territory.

A. E. Morrison, who was injured in the automobile races at Lowell, Mass., on the Fourth of July, is still confined to the hospital at that place, as his broken leg has not become sufficiently strong to enable him to be removed to his home in Boston. It is expected this will be done in a short time.

Major J. S. Keenan, who has been superintendent of the Massachusetts Automobile Club ever since the organization of the latter, has recently severed his connection with the club to assume a similar position with the new White garage on Newberry street, Boston, which it is expected will be ready by next September.

Owing to poor health, John Kane Mills, has retired from the presidency of the Dragon Automobile Company, Philadelphia, and has been succeeded by A. L. Kull, H. B. Rawle now being vice-president and manager. Nicholas Roosevelt has resigned as treasurer and T. F. Randolph has been succeeded as designer and superintendent of the works by Charles Kenen.

Frank B. Illsley, Chicago, who has been handling the Stevens-Duryea cars for several years past, has given up the agency and will retire from the retail business for the present, and possibly permanently, as he has some idea of going into manufacturing cars. Mr. Illsley will go to Europe in a few weeks and expects to spend about three months abroad investigating foreign methods of manufacturing. It is rumored in Chicago that the Stevens-Duryea people will open a Western branch in Chicago shortly with Louis Geyler as manager.

NEW TRADE PUBLICATIONS.

A preliminary catalogue from Charles Burgess, Jr., of Wenona, Ill., describes a new type of suspension spring, which, according to its inventor, will be placed on the market in a very short time.

The why and wherefore of the Prest-o-Lite tank is clearly put forth in a brochure from the Prest-o-Lite Company, Indianapolis, Ind., illustrated with numerous cuts showing the tanks in use for illuminating purposes on automobiles, boats, and in private residences. The use of the company's compressed air tanks for tire inflation is also explained.

Information on the lubrication of an automobile is contained in an illustrated booklet published by the Vacuum Oil Company, of Rochester, N. Y., under the title "The Preservation of a Smooth Running Machine." The feature of the book is a series of views of scenes on the Vanderbilt and Grand Prix courses, reproduced from leading automobile journals. Two pages of tables giving winners of all Vanderbilt races and all straightaway records made at Ormond are included.

A GROUP OF FRANKLINS THAT PARTICIPATED IN THE RECENT FALL RIVER, MASS., AUTO PARADE.

INFORMATION FOR AUTO USERS.

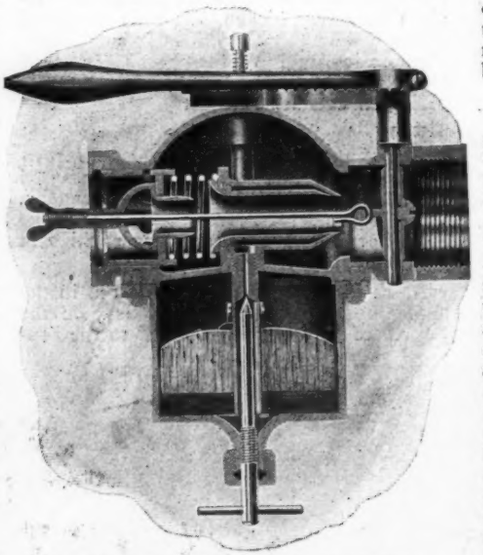
McCord Coolers.—A system of water-cooling that is essentially different so far as the construction of the radiator itself is concerned, is to be found in the McCord cooler, manufactured by McCord & Co., Old Colony building, Chicago. It consists of vertical water tubes running between an upper and lower water tank and through continuous horizontal radiating plates. The principle is practically that of the fin-tube

FRONT VIEW MC CORD COOLER.

cooler, with the advantage in this case that the fins of each tube are connected to and are continuous with those of the tubes next to it. This results in the entire surface of the metal being called upon to do an equal amount of the cooling irrespective of the amount of water flowing through the tubes, as anyone tube receiving more hot water than another radiates its excess heat to the fins of its adjoining tubes, and even though a tube became stopped up completely, the efficiency of the radiator as a whole would be but slightly impaired as its radiating surface would still be in use. The tubes and plates are sweated together, supporting one another in such a manner as to give the plate cooler a great advantage on the score of strength. This also permits the use of thinner metal, making the cooler as a whole far lighter than the ordinary form of construction. The tubes are 1-4 inch in diameter, and the plates are spaced eight to the inch, the standard plate being 2 3-4 inches wide, this being the depth of the cooler from front to back. There are five tubes in this distance and the radiating surface amounts to 48 square inches for every square inch of front area. The ornamental brass frames of the McCord coolers are independent and readily removable, thus greatly facilitating repairs without marring the appearance of the radiator as a whole.

Two New Sager Specialties.—In addition to the Sager Equalizing springs and antiskid chains that have been specialized by the J. H. Sager Company, Rochester, N. Y., for some time past, this firm will soon bring out two additional auto accessories of a special nature, the details of which are not forthcoming at the moment, but which are said to give great promise of success. The Sager Equalizing springs have been meeting with unusual favor during the past season, and some idea of the quality of the material of which they are made may be had from the fact that out of 8,000 sets of springs, but 20 showed flaws of any nature whatever. In fact, the makers are so confident of their product that they are giving an unusually liberal guarantee, *i. e.*, agreeing to replace *any* broken part within one year from date of sale. Nearly all the attachments for the springs are drop forgings, and in some special cases the brackets are hand forged. The Sager springs and their making are the outgrowth of 12 years' experience in bicycle saddle making, of which literally millions were turned out in that time.

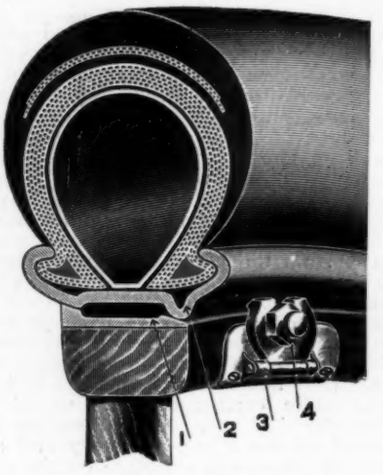
The Old Nick Carbureter.—As the result of fifteen years' investigation and experience of the problem of carburetion, the experience part representing nine years of actual use, the Pioneer Brass Works, 424 So. Pennsylvania avenue, Indianapolis, Ind., may well be said to be in a position to know considerable of the ins and outs of this most vexatious of all problems connected with the internal combustion motor. J. B. Knickerbocker is the inventor of the Old Nick carbureter and he has embodied in its latest and most recent form, which is illustrated herewith, many of the essential features which have seen service for nine years—something that can be said of very few similar devices connected with the automobiles that are on the market at the present day. The sectional view showing the internal arrangements of the carbureter shows its construction so plainly that a detailed description of it is scarcely necessary, the short paragraph to which the makers limit themselves in describing it probably being more than sufficient for all purposes. They say: "This carbureter will work in all positions except upside down, on all kinds of engines; it has a float valve that regulates, and auxiliary valves that auxiliarates at the will of the operator, it has a



SECTIONAL VIEW "OLD NICK" CARBURETER.

circular spray nozzle that vaporizes. A double volume of air, one part coming through the center of the circle and the other over the outside meets at the point of the spray nozzle and there vaporizes, making a perfect dry gas." It will be noticed that the device is distinguished both by its extreme simplicity and compactness, the mixing chamber being made dome-shaped.

An Eliminator of Tire Annoyances.—After struggling with a punctured or blown-out tire in heavy rain, under a hot sun or by the side of a mosquito swamp—why do tire troubles generally occur at such places?—the automobilist willingly admits that some more convenient method of changing tires than the old-fashioned one followed for years might be found. Numerous inventions having been tried, it is now pretty evident that the most satisfactory method is to carry an extra rim or two on which are mounted fully inflated tires, which will



CROSS SECTION CRESCENT RIM.

speedily replace the damaged one with the minimum expenditure of labor and the loss of only a few minutes' time. A rim of this type is produced by the Crescent Parts Company, of New York City, and handled by leading dealers under the title of the Crescent—formerly the same rim was known as the Harburg. All the essential qualifications of a dismountable rim, security and absence of binding after long use, are claimed for the Crescent, while the assertion that a tire can be changed in three minutes under this system is substantiated by all who have seen the operation.

Convertible Two and Four-Cycle Engine.—Points of superiority claimed for the convertible two or four-cycle gasoline motor as constructed by the North Chicago Machine Company are increased accessibility, flexibility and efficiency. The horsepower can be varied without change of motor speed. This is done by taking advantage of the fact that the chief thing necessary to make the present-day automobile motor convertible from one cycle to the other is a means of admitting and exhausting the charge. The change from the two to the four-cycle motor in this case is made through a double set of cams on the camshaft, all valves being mechanically operated. To the camshaft is connected two sets of gears, one being the two to one type commonly used on the four-cycle motor and the other a one to one gear to drive the camshaft the same number of revolutions as the crankshaft and operate the cams to open the valves in producing the two-cycle engine. In making the change from one type to the other the cam is shifted about one-half of an inch longitudinally, which disconnects the camshaft from the two to one gears and engages it with a set of one to one gears. Camshaft and crankshaft then revolve at the same speed and a new set of cams is engaged to operate the intake and exhaust valves. At the same time the spark timing is changed to conform with changed cycle of motor.